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A Guide to Identification of Benthic Isopoda from the Southern Beaufort Sea

M.J. Lawrence and M.A. Keast

Central and Arctic Region
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Winnipeg, Manitoba R3T 2N6

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A GUIDE TO IDENTIFICATION OF BENTHIC ISOPODA FROM THE SOUTHERN BEAUFORT SEA

edited by

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PREFACE

Production of this publication was funded by the Northern Oil and Gas Action Program (NOGAP) and the Department of Fisheries and Oceans, Central and Arctic Region. It is one of a series of identification manuals to the invertebrates of the southern Beaufort Sea region. This document is in part the result of work conducted under the terms of a Department of Supply and Services contract issued to Invertebrate Research Associates (DSS Contract No.'s FP430-5 9056, FP430-7 9047/01-35F). The scientific authority was M. J. Lawrence, Department of Fisheries and Oceans, Central and Arctic Region, 501 University Crescent, Winnipeg, Manitoba, R3T 2N6.

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ABSTRACT

Lawrence, M.J., and M.A. Keast (ed.) 1990. A guide to the identification of benthic Isopoda from the southern Beaufort Sea. Can. Manuscr. Rep. Fish. Aquat. Sci. 2048: v + 76 p.

A guide to sixteen species of benthic isopods from the southern Beaufort Sea, including its coastal embayments is presented. Four suborders, the Asellota, Gnathiidea, Valvifera, and Epicaridea, are discussed. The guide, subdivided into suborder, family, and species, is artifical and dichotomous in design. Illustrations, references, and species descriptions are included.

Key words: Isopods; taxonomy; identification keys; Asellota; Gnathiidea; Valvifera; Epicaridea; Beaufort Sea.

RÉSUMÉ

Lawrence, M.J., and M.A Keast. (ed.) 1990. A guide to the identification of benthic Isopoda of the southern Beaufort Sea. Can. Manuscr. Rep. Fish. Aquat. Sci. 2048: v + 76 p.

Le présent article constitue un guide pour l'identification de seize espéces d'isopodes benthiques présents dans la partie sud de la mer de Beaufort et ses baies. Quatre sous-ordres, Asellota, Gnathiidea, Valvifera et Epicaridea, sont discutés. Le guide, subdivisé en sous-ordres, familles et espèces, est de conception artificielle et dichotomique. Il comprend des illustrations, des références et des descriptions d'espèces.

Mot-clés: Isopodes; taxinomie; clés d'identification; Asellota; Gnathiidea; Valvifera; Epicaridea; sud de la mer de Beaufort.

Errata Sheet

Lawrence, M.J., and M.A. Keast. (ed.) 1990. A guide to identification of benthic Isopoda from the southern Beaufort Sea. Can. Manuscr. Rep. Fish. Aquat. Sci. 2048: v + 76 p.

Page ii add at end of preface "This document constitutes NOGAP Report B2.5".

INTRODUCTION

Assessments of the effects of coastal development activities on the nearshore aquatic environment often rely upon pre- and post-development monitoring of benthic invertebrate populations and communities. Identification guides such as this one, which are restricted to regionally occurring species, offer the advantage of simplicity and allow the use of more obvious gross features as criteria for keying out specimens. It is our intention that this simplification will result in more accurate identifications by those who are not expert taxonomists. The disadvantage to a regional guide is that it is not exhaustive for all species, so there is the possibility a specimen, not included in the guide, may be mis-identified as opposed to being not identified. To ensure that this does not happen, we encourage the use of this guide as a valuable and time-saving complement to the more comprehensive taxonomic literature and expertise that are available.

The guide is artificial and dichotomous in its design, using mutually exclusive couplets. Phylogenetic relationships are not demonstrated. Several distinctive characters are provided within the guide to aid in proper species identification. Key characters selected are absolute, easily perceived, and constant. A glossary of terms used in the text is also included. The reference list provided is not exhaustive, but does provide additional information if required.

Four isopod suborders, the Asellota, Epicaridea, Gnathiidea, and Valvifera are reported and represented by ten families and sixteen species, all of which are typically benthic and cryptic in nature.

Many of the specimens used to develop this guide were collected during surveys conducted by the Department of Fisheries and Oceans (DFO), Winnipeg, Manitoba. Species reported in other collections from the region (Richardson 1905; Gurjanova 1934; MacGinitie 1955; Bray 1962; Menzies and Mohr 1962; Wacasey 1975; Wacasey et al. 1977; Robilliard and Busdosh 1979, 1980; Percy and Fife 1980; Thomas et al. 1981; Sutherland 1982; Percy 1983; Korczynski 1983) were included, as were specimens from unpublished collections. The species list includes all isopods that have been reported from the region.

SITE DESCRIPTION

SOUTHERN BEAUFORT SEA SHELF

The region covered in this guide is that portion of the southern Beaufort Sea within Canadian boundaries lying to the south of 72°N latitude bound to the east by McKinley Bay (70°N, 131°W) and to the west by Herschel Island (138°W, 69°N), Yukon Territory. The coastline is characterized by numerous embayments with depths ranging from a few to ten's of metres. The bathymetry is characterized by a broad shallow continental shelf bordering the mainland coast with the shelf margin lying between the 100 and 200 m isobaths (Cornford et al. 1982). The shelf may be as far offshore as 150 km with depths of less than 10 m occurring up to 30 km offshore (Cornford et al. 1982). It is discontinuous to the west off Herschel Island where the Mackenzie Trough has depths of 100 m or more within 35 km of the coastline. Eastward another trench extends from

Kugmallit Bay to the outer margin of the shelf. This is most evident north of the Tuktoyaktuk peninsula.

During the summer months, Mackenzie River outflow introduces fresh water in the Beaufort Sea influencing the physical and chemical properties of surface waters. The degree of intermixing, dependent on tides, currents and prevailing wind conditions, determines the salinity, temperature, turbidity and nutrient levels of the waters over the shelf. The river outflow also transports alluvium which attenuates penetration of sunlight reducing photosynthesis.

Lunar tides are negligible in the Beaufort Sea. There is a reduced intertidal zone and tidal currents are usually weak.

METHODS

Most animals used for illustrative purposes were obtained from the Beaufort Sea; however four isopod species (Appendix 1) not available for drawings were obtained from other Arctic locations (courtesy of J. Wacasey, Arctic Biological Station, Ste Anne de Bellevue, Quebec). The specimens of Macrostylis spinifera G.O. Sars 1864, and Ilyarachna sp. G.O. Sars 1863 were collected during earlier Beaufort Sea surveys (Wacasey 1975). Drawings of Munna kroeyeri Goodsir 1842 and Pleurogonium spinosissimum G.O. Sars 1866 were from G.O. Sars (1899), for which copyright permission was granted. These drawings were closely compared with the single specimens of each of the species in our collection. Permission was also granted for the inclusion of Plate I (the basic Asellota, Gnathiidea and Valvifera).

Illustrations were prepared using a WILD M8 stereo microscope and a WILD M20 compound microscope each equipped with a camera lucida. The total body length was measured dorsally from the anterior margin of the cephalon to the posterior tip of the telson. The description of each species is based on the specimen illustrated. All specimens used are stored in the invertebrate collections of DFO, Winnipeg, and Invertebrate Research Associates, Winnipeg, with the exception of those received on loan from J. Wacasey.

MAJOR IDENTIFYING CRITERIA

The general body plan for the asellid, gnathiid and valviferan isopods is illustrated in Plate I. The Epicaridea (=Bopyroidea), parasitic on crustaceans, are often highly modified anatomically and show little resemblance to free-living forms. Epicarideans are described in Appendix 2.

Isopods are depressed dorsoventrally with the general outline of the body varying considerably. Many forms are narrow and elongate while others are broadly oval or cylindrical. The body has three major divisions; the cephalon, pereon and pleon, relating respectively to the head, thorax and abdomen. A carapace is absent in isopods.

Spinal and setal ornamentation of the body, and especially the appendages are common. Isopods possess two pairs of antennae which vary in length and in the number of joints (articulations) of the flagellum. On antenna 1, the

flagellum is attached to a 3-segmented peduncle; on antenna 2, to a 5-segmented peduncle.

The thoracic region is segmented, with the first one or two segments fused with the head. The remaining free thoracic region (pereon) is divided into seven segments (pereonites), each normally with a pair of legs (pereopods). In gnathiids five pereonites are visible dorsally, each bearing one pair of pereopods.

The pereopods vary in structure and size between species. They may be ambulatory, natatory, or used for grasping and excavating. These arrangements are of taxonomic importance at the family level. Pereopods have 7 segments which may be referred to by name or number; coxa (1), basis (2), ischium (3), merus (4), carpus (5), propodus (6) and dactyl (7). The coxa is commonly expanded forming a coxal plate which may be partially or completely fused with the pereonite and as a result may or may not be recognizable as being distinct from the pereonite. The size, shape, ornamentation and degree of fusion to the pereonites is of taxonomic importance at the family and genus levels. The dactyl may be absent in some species. Pereopods are numbered 1-7 (1-5 for the gnathiids).

The degree of fusion of the six segments (pleonites) of the abdominal region (pleon) differs between suborders. Typically, Gnathiidea show the least amount of fusion; only the last segment is fused with the telson forming the pleotelson. In Asellota, usually only the first and occasionally the second pleonite is free. The remaining pleonites are fused with the telson forming a large shield-like pleotelson. In Valvifera the pleonites are fused to varying degrees; with the 1st, 2nd, or 3rd pleonites free, depending on the genera.

A pair of biramous appendages are attached to each pleonite. The anterior five pairs are called pleopods and may perform a respiratory, swimming or protective function. In male isopods, the first and second pleopods or only the second, are modified to assist in sperm transfer. The posterior pair, the uropods, may be fan- or stick-shaped possessing a peduncle with two unjointed branches or rami, the endopod and exopod. Uropods may be attached in a ventral, terminal or lateral position. In Asellota, the pleopods lie flat against the ventral surface and one or more pair are modified to form a plate-like protective structure (operculum) which serves as protection of the other respiratory and/or natatory pleopods. In Valvifera the uropods are modified to form a paired valve structure to protect the pleopods.

Sessile compound eyes are typical in those isopods that do have eyes; they are situated dorsally or laterally on the cephalon. Many bathyal species are eyeless.

Males are recognized by the presence of paired or single genital papillae on the ventral surface of the last pereonite. Ovigerous females can be readily identified by the presence of a ventral marsupium comprised of 5 pairs of overlapping oostegites. Males and females are similar in general characteristics for the valviferans and for most asellids, although slight differences in proportions may occur. Males, females and juveniles of the suborder Gnathiidea are morphologically distinct.

SYSTEMATIC LIST

PHYLUM ARTHROPODA
SUBPHYLUM CRUSTACEA
CLASS MALACOSTRACA
SUBCLASS EUMALACOSTRACA
SUPERORDER PERACARIDA
ORDER ISOPODA

SUBORDER ASELLOTA
Superfamily Paraselloidea

Family Desmosomatidae
Desmosoma lineare G.O. Sars 1864
Desmosoma tenuimanum (G.O. Sars 1865)

Family Eurycopidae
Eurycope pygmaea G.O. Sars 1869
Munnopsurus giganteus (G.O. Sars 1877)

Family Ilyarachnidae
Ilyarachna sp. G.O. Sars 1863

Family Macrostylidae
Macrostylis spinifera G.O. Sars 1864

Family Munnidae
Munna kroeyeri Goodsir 1842

Family Munnopsidae
Munnopsis typica M. Sars 1860

Family Pleurogonidae
Pleurogonium spinosissimum (G.O. Sars 1866)

SUBORDER GNATHIIDEA

Family Gnathiidae
Gnathia elongata (Krøyer 1849)
Gnathia stygia G.O. Sars 1877

SUBORDER VALVIFERA
Family Idoteidae
Mesidotea entomon (Linnaeus 1767)
Mesidotea sabini (Krøyer 1849)
Mesidotea sibirica (Birula 1896)
Synidotea bicuspida (Owen 1839)

APPENDIX II:

SUBORDER EPICARIDEA (=Bopyroidea)

Family Dajidae
Dajus mysidis Krøyer 1849

KEY TO ISOPODS OF THE SOUTHERN BEAUFORT SEA

1a 5 pairs of pereopods; 5 pereonites; pleonites appreciably narrower than pereonites . . . . . .Gnathiidea, 2

1b 7 pairs of pereopods; 7 pereonites; pleonites not appreciably narrower than pereonites 3

2a With eyes . . . . . Gnathia elongata (Krøyer 1849)
Plates II - V

2b Without eyes. . . . . Gnathia stygia G.O. Sars 1877
Plates VI - VII

3a Uropods ventral (folded under pleotelson) forming a protective covering for the pleopods; pleonites reduced, fused to some degree with each other (1-4 free) . . . . . Valvifera, 4

3b Uropods terminal, stick-like; normally only 1 free pleonite . . . . . Asellota, 7

4a Coxal plates completely fused with pereonites; pleon with 1 partially fused pleonite; pleotelson apex excavated . . . . . Synidotea bicuspida (Owen 1839)
Plates XVIII - XX

4b Coxal plates distinct on pereonites 2-7; more than 1 free pleonite; pleotelson apex not excavated 5

5a Eyes absent; body elongate; coxa 2 slightly reduced, posterior margin of pereonite 2 rounded . . . . . Mesidotea sabini (Krøyer 1849)
Plates XI - XIII

5b Eyes present; body ovate, broad; coxa 2 expanded, posterior margin of pereonite 2 pointed in comparison to Mesidotea sabini 6

6a Pleotelson pentagonal, lateral surfaces tuberculate; lateral margin of pleotelson serrated in juveniles; coxae 2-4 with a pronounced diagonal keel (not evident in juveniles). . . . . Mesidotea sibirica (Birula 1896)
Plates XIV - XVII

6b Pleotelson subtriangular, lateral surfaces smooth; coxae 2-4 with no diagonal keels . . . . . Mesidotea entomon (Linnaeus 1767)
Plates VIII - X

7a Only pereopods 5, 6 and/or 7 natatory 8

7b Pereopods 2-7 natatory or 1-7 ambulatory 11

8a Antenna 2 and pereopods 3 and 4 elongated to several times body length; pereon constricted after segment 4; natatory appendages lacking dactyls . . . . . MUNNOPSIDAE
Munnopsis typica M. Sars 1860
Plates XXXVIII - XLI

8b Antenna 2 and pereopods 3 and 4 slender and elongate (not as extreme as in MUNNOPSIDAE); pereon not constricted; natatory appendages bearing dactyls 9

9a Pereopods 1-4, basis of essentially equal length; pereopods 5-7 natatory; antenna 1, bases widely spaced (never close together) on cephalon, separated by produced frontal margin of cephalon . . . . . EURYCOPIDAE 10

9b Pereopods 3 and 4, basis shorter than for pereopods 1 and 2; pereopods 5 and 6 natatory, pereopod 7 ambulatory; antenna 1, bases located medially on anterior margin of cephalon; cephalon slightly produced anteriorly . . . . . ILYARACHNIDAE
Ilyarachna sp. G.O. Sars 1863

10a Antenna 2 and pereopods 2-4 several times body length; pereonites 5 and 6 free; pleotelson ovate, lateral margins arched, without setae, emarginate apically . . . . . .
. . . . . *Munnopsurus giganteus* (G.O. Sars 1877)
Plates XXIX - XXXII

10b Antenna 2 and pereopods 2-4 equal to body length; pereonites 5 and 6 partially fused; pleotelson triangular, lateral margins not arched, setose, truncate apically . . . . . .
. . . . . *Eurycope pygmaea* (G.O. Sars 1869)
Plates XXVI - XXVIII

11a Pereopods 2-7 natatory; pereopod 1 ambulatory . . . . . .
. . . . . DESMOSOMATIDAE 12

11b Pereopods 1-7 ambulatory 13

12a Pereonite 5 largest, quadrangular with anterolateral angles acutely produced (more pronounced in females); uropods uniramous; pleotelson rounded apically in female, broader in male, without marginal setae .
. . . . . *Desmosoma lineare* G.O. Sars 1864
Plates XXI - XXII

12b Pereonite 5 not largest, rounded quadrangular; uropods biramous; pleotelson tear-shaped, with marginal setae . . . . . .
. . . . . *Desmosoma tenuimanum* (G.O. Sars 1865)
Plates XXIII - XXV

13a Body elongate, narrow; uropods long, exceed length of pleotelson . . . . . MACROSTYLIDAE
Macrostylus spinifera G.O. Sars 1864
Plates XXXIII - XXXV

13b Body oval shape; uropods short, do not exceed length of pleotelson 14

14a Eyes well developed on lateral projections of cephalon; cephalon broader than 1st pereonites; pleotelson ovate to pear-shaped . . . . . MUNNIDAE
Munna kroeyeri Goodsir 1842
Plates XXXVI - XXXVII

14b Eyes absent; cephalon small, narrower than 1st pereonite; pleotelson heart-shaped . . . . . PLEUROGONIDAE
Pleurogonium spinosissimum (G.O. Sars 1866)
Plates XLII - XLIII

GLOSSARY

ACUMINATE	Tapering to a point.
AMBULATORY	Modified for walking.
APEX	That part of any joint or segment opposite the base by which it is attached.
APICAL	At, near or pertaining to the apex of any structure.
ARCHETYPE	A basic prototype or model; a generalized structure assumed to be possessed by the ancestors of the taxon.
ARCUATE	Arched, curved like a bow.
ARTICULATE	Formed of joints or segments.
BASIS	The 2nd segment of a thoracic appendage; antennal base refers to insertion base on cephalon.
BIRAMOUS	Having two branches.
BRISTLE	A stiff, coarse hair-like structure, usually short and blunt.
BULBOUS	Bulb-like; swollen to form a bulb.
CARINA	Keel-like structure; not necessarily high or acute.
CARPUS	The 5th segment of a thoracic appendage.
CAUDAL FAN	Laterally expanded uropods with telson forming swimming structure, also used for balance.
CEPHALON	Head region to which is fused one (or two, as in Gnathiidea) thoracic segment; bears eyes, if present, antennae, and mouth parts.
CHELA	A terminal pincer formed by an immovable and movable finger.
CHELATE	Having the form of a chela.
CLEFT	A fissure, slit or opening, e.g. operculum may be cleft resulting in a bilobed structure.
COPULATORY STYLET	Median process of endopod of second pleopod of male isopods; serves in copulation.
COXA	Segment 1 of the pereopod.
COXAL PLATE	Expansion of coxa into plate-like structure. May be fused to pereon.

CRENATE	Scalloped with small, blunt, rounded teeth.
CRYPTIC	Hidden or concealed.
DACTYL	Terminal segment (7th) of a thoracic appendage; usually clawlike - absent in some species.
DENTATE	Having teeth-like conical projections (of margin).
DENTIFORM	Formed or appearing like a tooth.
DISTAL	Away from point of origin.
EMARGINATE	Shallowly concave, as in the apex of a telson.
EVAGINATION	Outgrowth or outpouching.
EXCAVATE	Incised or emarginate, but more deeply.
FLAGELLUM	The usually multiarticulate, sometimes whiplike terminus of antennae 1 and 2; that portion beyond the peduncle.
FUSIFORM	Spindle-shaped; tapered distally and proximally.
GNATHIC	Prehensile, but more related to food handling.
GNATHOPODS	Pereopods 1 and 2 modified for grasping, holding and excavating.
ISCHIUM	The 3rd segment of a thoracic appendage.
JOINT	Segment or division.
JUXTAPOSED	Placed side by side.
KEEL	A ridge or ridge-like process.
LAMELLA	A thin, plate-like structure.
LAMELLIFORM	Made up of or resembling leaves, blades or lamellae.
MARSUPIUM	A brood pouch on the ventral surface of adult females, which acts as a receptacle for holding eggs.
MERUS	The 4th segment of a thoracic appendage.
NATATORY	Modified for swimming.
OBOVATE	Oval, broader distally.
OOSTEGITES	A plate-like expansion of the basal segment of a thoracic appendage in many crustaceans that helps to form a receptacle for the eggs.
OPERCULUM	Flap or valve covering the pleopods.

OVATE	Oval, broader proximally.
OVIGEROUS	Carrying eggs; applies to the fertilized female.
PEDUNCLE	The basal segment(s) of paired, usually biramous, appendages, as in pleopods, uropods, or antennae.
PELLUCID	Clear, transparent.
PEREON	The 7 thoracic segments bearing gnathopods or pereopods; 5 in Gnathiidea.
PEREONITE	A single segment of the pereon.
PEREOPOD	A uniramous appendage of the pereon; composed of 7 segments of varying shape and size.
PLEON	Abdominal region (which is visible).
PLEONITE	A segment of the pleon; number of free pleonites varies depending upon degree of fusion with the telson.
PLEOPOD	A biramous appendage of the abdomen; can be modified for swimming, respiration or both.
PLEOTELSON	Structure formed by fusion of one or more pleonites with telson.
PLUMOSE	Feather-like.
PREFRONTAL LOBE	Lobe(s) laterally situated on dorsal surface of cephalon reaching beyond frontal margin.
PREOCULAR HORN	Cylindrical projection of cephalon; situated in front of the eyes.
PREHENSILE	Fitted or adapted for grasping, holding or seizing.
PROPODUS	The 6th segment of a thoracic appendage.
PROXIMAL	Nearest to body or point of attachment.
RAMUS	Branch.
RHOMBOID	Shape of 4-sided figure with opposite sides equal and parallel but two of angles oblique.
ROTUND	Spherical or rounded in outline.
SERRATE	Notched, teeth like a saw-blade.
SETA, pl. SETAE	Slender hair-like structure.
SETULA, (pl. SETULAE)	A small stiff bristle or seta.

SETOSE	Furnished with setae.
SINUATE	Wavy, specifically of edges or margins.
SPINIFORM	In the form or shape of a spine.
SPINOSE	Possessing spines, spiny.
STOUT	Strong, robust, bulky.
STYLIFORM	Slender, elongate in form, terminating in a point.
SUBCHELATE	A condition of the pereopod or gnathopod; less than fully chelate.
SULCUS	Furrow or groove.
TELSON	Terminal portion of the abdomen.
TRUNCATE	Blunt; appearance of sharply cut-off or broken-off squarely.
UNIRAMOUS	Having a single branch.
UROPOD	One of a pair of appendages located terminally, laterally or ventrally on the last segment of the abdomen.

DIAGNOSES AND DESCRIPTIONS

SUBORDER: GNATHIIDEA

Diagnosis: polymorphic, with males and females differing appreciably in body form and juveniles resembling immature females; 5 pereonites are visible dorsally each bearing 1 pair of pereopods; male mandibles[1] are very large and powerful extending anteriorly beyond cephalon; pleonites appreciably narrower than pereonites; uropods lateral, flattened, visible dorsally forming a tail-fan with the pleotelson; pleotelson triangular; females lack true peracarid marsupium, ova undergo development within the dilated body cavity; pleopods natatory (in juveniles) or exclusively respiratory (in adults); adults tend to be bottom dwellers, sluggish in habit, juveniles ectoparasitic on fish.

References: Sars 1899; Richardson 1900a, 1904, 1905; Hansen 1916; Yashnov 1948; Miller 1975.

FAMILY: GNATHIIDAE

Diagnosis: pereon composed of 5 distinctly visible segments although partially coalesced anterior and posterior segments are apparent; pleon abruptly narrower than pereon, composed of 6 segments; sexual dimorphism apparent, male body depressed and dilated anteriorly, female fusiform, larva resembles female; found in deep as well as shallow waters off most continental shelves.

References: Sars 1899; Richardson 1905.

Gnathia elongata (Krøyer 1849) Plates II-V

Male: body elongate, dorsal surface of cephalon and pereon highly ornamented with spines and setae of varying length, tubercles, depressions and ridges; cephalon large, quadrangular, produced anteriorly above eye base, lateral margins below eye base serrated; large mandibles project forward beyond cephalon; eyes medium, bulbous; antenna 1 shorter than 2; antenna 2, peduncle segment 3 smallest, quadrangular, peduncle segment 5 elongate, setose on posterior margin, 7 flagellar articles; pereonites 1 and 2 serrated along lateral margin; pereonite 3 serrated medially along anterior margin, pereonites 4 and 5 with large tubercle outgrowths on lateral margins; pereonite 4 divided dorsally into 2 halves by a longitudinal groove; pleon narrow, short in length; pereopod 1, propodus serrated along posterior margin with 2 medial spines, coxa surface bears many tubercles and 17 long setae, basis elongate, bearing long setae on anterior margin; pereopods 2 and 4, propodus serrated along anterior margin with a single median spine; uropods biramous, subequal, lamelliform, marginally setose with long plumose and fine setae; pleotelson triangular with 2 long apical setae and 3 long setae on lateral margins interspersed with

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[1]Although mouth parts for most species have been omitted from the guide because of their diminutiveness, an exception has been made for this taxon since the mandibles are easily observed and diagnostic for the male.

several short setae; colour greyish-white with light blue tinge; length 4.5 - 5 mm.

Female: body broader than male, large, rotund, translucent, dorsal body not ornamented as in male; cephalon small, triangular (juvenile cephalon also triangular), frontal margin slightly produced bearing 4 long setae; antennae 1 and 2 equal; eyes medium, bulbous, located on lateral margins; pereonites 1 and 2 reduced, last 3 pereonites large, well defined; pereopods 1-5 ambulatory; pereopod 1, coxa bears 7 long setae, surface smooth, not tuberculate as in male; pleotelson triangular; colour yellowish-brown, semipellucid; length 3-3.5 mm.

Distribution: circumpolar; Beaufort Sea; Frobisher Bay; Atlantic coast of North America; west Greenland; coastal waters of Finland; Lofoten Island waters, Norway; Kara Sea.

References: Sars 1899; Richardson 1900a, 1901, 1905; Hansen 1916; Gurjanova 1934, 1936; Yashnov 1948; Naylor 1957a; Schultz 1969.

Gnathia stygia (G.O. Sars 1877) Plates VI-VII

Without eyes; pereopods strongly spinous; head small, much narrower than pereon; margins of uropods and telson dentate; pleopods elongate and smooth; entire body armoured with sharp tubercles; flagellum of 1st antenna with 5 articles; 2nd antenna with 7 articles; 4th segment of pereon with a pronounced dorsomedial sulcus; male with small mandibles in comparison to Gnathia elongata; length 10-12 mm.

Distribution: Arctic Ocean; Iceland; Norway; Barents Seas; Kara Sea; Southern Beaufort Sea; South of Jan Mayen; and North of the Faeroes.

References: Hansen 1916; Naylor 1957; Barnard et al. 1962; Just 1980.

SUBORDER: VALVIFERA

Diagnosis: uropods form opercular valves that fold over the pleopods; each of the 7 pereonites bear 1 pair of usually ambulatory pereopods; coxae expanded to form coxal plates which may be ornamented, or fused with the pereonites; pleonites fused to some degree.

References: Sars 1899; Richardson 1900a, 1904, 1905; Hansen 1916; Yashnov 1948; Sheppard 1957; Schultz 1969; Kussakin 1973; Miller 1975; Brusca 1984.

FAMILY: IDOTEIDAE

Diagnosis: head not laterally produced; antenna 1, flagellum uniarticulate; antenna 2, flagellum uniarticulate or multiarticulate; anterior 3 pairs of pereopods may be subchelate (prehensile); pereopods similar and ambulatory; uropods uniramous (except in Mesidotea Richardson and Cleantis

Dana); fusion of body parts to some degree (coxae, pleonites, antennal flagellum, and maxillipedal palp).

References: Sars 1899; Richardson 1905; Menzies 1950; Menzies and Miller 1972; Kussakin 1982; Brusca 1984.

Mesidotea entomon (Linnaeus 1767) Plates VIII-X

Body ovate, tapering posteriorly; cephalon, lateral margins cleft with 2 lobes of about equal size, anterolateral lobe rounded, posterior lobe slightly acute; frontal margin of cephalon deeply excavate between anterolateral lobes with a median excavation; eyes small, round, compound in structure situated dorsally near base of lateral cleft of cephalon; antenna 1, peduncle segment 2 smallest with several setae on anterior margin, peduncle segment 3 elongate, slender, bearing several setulae along anterior margin, flagellum elongate, slender, slightly longer than peduncle segment 3 with row of forked setae along anterior margin; antenna 1 shorter than antenna 2; antenna 2, male with 11 flagellar articles, peduncle segments 2-5 with long plumose setae along posterior margin; pereonite 7 narrower than preceeding 6 pereonites; coxae distinct on pereonites 2-7; coxae laterally setose, posteriorly produced to a long acutely pointed process; coxal surface smooth; pereopods 1-3, propodus expanded, posterior margin spinous and anterior margin setose, carpus acutely produced, dactyl large, reflexed; pereopods 4-7, posterior margin with row of long, slender setae, merus to propodus anterior margin with long spines, dactyl large, reflexed; 4 reduced pleonites; pleotelson triangular, partially coalesced with last pleonite, pleotelson converges to a narrowly pointed extremity, uropods divisible into a broad basal section and a short, narrow, pointed biramous terminal section with inner ramus small, attached to base of outer ramus; uropod margins with row of plumose setae; female 42.5-63.0 mm, and males 58.0-87.0 mm from Pauline Cove, Herschel Island, Yukon Territory, and female 25-39.5 mm and males 32.5-55.0 mm from Dolomite Lake, N.W.T. (Korczynski 1983). Sexually mature male and female M. entomon inhabiting marine waters are larger in total body length compared with those inhabiting fresh waters (Johnson 1962, 1964; Narver 1968; Korczynski 1983). It is not known whether M. entomon in freshwater habitats in the Canadian arctic and subarctic is a distinct physiological or morphological subspecies or the same as those inhabiting a brackish or saltwater habitat (Korczynski 1983).

Distribution: circumpolar; characteristic of continental shelf of arctic regions and some freshwater lakes - Beaufort Sea; west coast of North America to Pacific Grove, California; Nakvak, Labrador; Kara Sea; also representative in boreal water of the Atlantic and Pacific Oceans; Caspian Sea; freshwater lakes in Sweden, Finland, Siberia; Baltic Sea; Lake Ladoga, U.S.S.R.; White Sea; Thetis Is.; Barter Is.; Harrison Bay.

References: Richardson 1900a, 1905, 1910; Boone 1920; Bruun 1924; Gurjanova 1933; Hatch 1947; Yashnov 1948; MacGinitie 1955; Forsman 1956; Mulicki 1957; Bray 1962; Johnson 1962, 1964; McCrimmon and Bray 1962; Menzies and Mohr 1962; Bagge et al. 1965; Narver 1968; Kussakin 1973; Crane 1974; Haahtela 1975, 1978a,b; Griffiths and Craig 1978; Robilliard and Busdosh 1979, 1980; Percy and Fife 1980; Korczynski 1983; Percy 1983; Leonardsson 1986.

Mesidotea sabini (Krøyer 1849) Plates XI-XIII

Body elongate, anterior pereonites broader than posterior, body tapers to a long, slender, pentagonal telson; eyes lacking; cephalon anterolateral margin cleft, 2 lobes rounded, posterior lobe 2-3x as large as anterior lobe; frontal margin of cephalon excavate between anterolateral lobes with a small median excavation; antenna 1, anterior margin setose, peduncle segment 2 smallest, peduncle segment 3 elongate; antenna 2, peduncle segments bearing long setae on posterior margin, 10 flagellar articles; antenna 2 length extends to pereonite 1; pereonites similar in size and shape; coxae distinct on pereonites 2-7, on pereonites 4-7 acute posteriorly; pereopods 1-3, carpus reduced, acute, propodus large, expanded, posterior margin with a row of spines, dactyl reflexed; pereopods 4-7, propodus elongate, carpus rounded quadrangularly, merus to propodus anterior margin with row of spines, dactyl reflexed; pleon composed of 3 free reduced pleonites; pleotelson partially coalesced with last (4th) pleonite, tapers to a long, pointed extremity; uropods divisible into large basal section and short, narrow, pointed biramous terminal section with inner ramus small, attached to base of outer ramus; male 85-90 mm, females smaller.

Distribution: circumpolar; Beaufort Sea; Alaskan coastal waters; Davis Strait; Repulse Bay; Barents Sea; Spitsbergen; Kara Sea; Nordenskjold Sea; Pacific coast of North America; Greenland; Siberian Polar Sea.

References: Weber 1884; Richardson 1900a, 1901, 1904, 1905; Hansen 1916; Gurjanova 1933; Yashnov 1948; Bray 1962; Menzies and Mohr 1962; Percy and Fife 1980; Korczynski 1983; Percy 1983.

Mesidotea sibirica (Birula 1896) Plates XIV-XVII

Body robust; cephalon cleft at lateral margins, 2 lobes of equal size, margins setose; frontal margin of cephalon with median excavation between anterolateral lobes; eyes medium; antenna 1 shorter than antenna 2; antenna 2 long setae on posterior margin of peduncle segments, peduncle segments 2-4 rounded quadrangular, peduncle segment 2 plumose setae on anterior margin, 9 flagellar articles; pereopods 1-3 subchelate, propodus posterior margin bearing long and short spines, carpus acutely produced, posterior margin setose interspersed with short and long spines, dactyl reflexed; pereopods 4-7 bearing plumose and simple setae on posterior margin, carpus and propodus rounded rectangularly with row of spines of varying length, dactyl reflexed; coxae of pereonites 2-4 rhomboid with diagonal keel (keel not evident in juveniles); pleotelson distinctly pentagonal with rounded tubercles laterally, lateral margins smooth in adult, serrated in juveniles; uropod divisible into a broad basal section and a short, narrow, pointed biramous terminal section with inner ramus small, oval, attached to base of outer ramus; male 70-75 mm, females smaller.

Distribution: Siberia to northeastern Alaska; Beaufort Sea; Frobisher Bay; Kangigirik Pt.; Harrison Bay; Sanigaruak Pass; Kara Sea; Bering Strait.

References: Richardson 1905; Gurjanova 1933; Yashnov 1948; Bray 1962; Menzies and Mohr 1962; Schultz 1969; Percy and Fife 1980; Korczynski 1983, 1985; Percy 1983.

Synidotea bicuspida (Owen 1839) Plates XVIII-XX

Body ovate, lacking tubercules, pereon outline generally arcuate; eyes large, extending beyond lateral margins of cephalon; cephalon[2] prefrontal lobes small, close to frontal margin, frontal margin concave with median excavation, 2 small tubercles medially located on cephalon; antenna 1, peduncle segment 1 short, peduncle segments 2 and 3 elongate; antenna 2, peduncle segment 1 inconspicuous from dorsal view, peduncle segment 2 equal in length to peduncle segment 1, peduncle segments 3 and 4 each twice length of peduncle segment 2, peduncle segment 5 elongate, 16 flagellar articles; pereon slightly elevated, transverse ridge across each pereonite near the posterior margin, last 3 pereonites reduced in width compared with first 4; pereonites 1-5, lateral margins evenly rounded; coxae fused to pereon; pereopods 1-3, ischium to propodus with long setae along posterior margin, carpus with a spiniferous process, dactyl long, reflexed; pereopods 4-7, propodus elongate, setose on anterior margin, dactyl long, reflexed; uropods, basal section largest with 2 ridges, margins sparingly setose, terminal section tapers distally; pleon has 1 partially fused pleonite; pleotelson triangular, apically emarginate; male 28.5 to 32 mm.

Distribution: Bering Sea; Alaskan waters; Beaufort Sea; Pacific coast to central California; Atlantic coast to Labrador; Arctic Ocean; Barents Sea; Siberian coast; Kara Sea.

References: Benedict 1897; Richardson 1900a, 1901, 1905, 1910; Gurjanova 1933, 1936; Hatch 1947; Yashnov 1948; Sheppard 1957; Menzies and Miller 1972; Miller 1975; Kussakin 1982.

SUBORDER: ASELLOTA

Diagnosis: general body form varies greatly, can be broad, depressed, elongate or slender and may approach a cylindrical shape, may or may not be pigmented; most species are eyeless; cephalon well defined; coxal plates very small or absent, never forming a marginal area; pereon composed of 7 segments each bearing 1 pair of pereopods; some species are capable swimmers by presence of 3 posterior natatory pereopods which propel the animal backwards; distinguishing characteristic is the large shield-like pleotelson plus usually 1 but up to 3 free reduced pleonites, remaining uropods terminal, usually styliform.

The distinguishing taxonomic character in Asellote classification is the pleopod morphology (Hansen 1905; Wolff 1962; Hessler et al. 1979; Wilson 1980). Asellota are divisible into 4 superfamilies; Aselloidea, Paraselloidea, Parastenetrioidea, and Stenetrioidea (Wolff 1962). Only representatives of the Paraselloidea are reported from surveys conducted in this study area.

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[2]There is no apparent differentiation in the cephalon shape and location of eyes as shown in Benedict (1897) and Menzies and Miller (1972) for specimens examined from the Beaufort Sea. The cephalon for males and females is similar as shown in Plate XIX.

References: Richardson 1900a, 1904, 1905; Hansen 1905, 1916; Yashnov 1948; Birstein 1951; Wolff 1962; Kussakin 1973; Miller 1975; Hessler et al. 1979; Wilson 1980.

FAMILY: DESMOSOMATIDAE

Diagnosis: body elongated; cephalon emarginate laterally for antennal insertion, frontal margin produced; eyes lacking; antenna 1 small, set widely apart; antenna 2 larger than 1, slightly elongate; pereonites 5-7 separated from pereonites 1-4 by a marked constriction; pereopod 1 prehensile, slender and ambulatory; pereopods 2-7 natatory and setose; coxae evident in males on at least 3 of pereonites 1-4; uropods bi- or uniramous; pleotelson apex rounded.

References: Richardson 1905; Hansen 1916; Wolff 1962; Schultz 1969.

Desmosoma lineare G.O. Sars 1864 Plates XXI-XXII

Body slender, linear in form; cephalon of female transversely truncated, male is slightly sinuated; antennae 1, flagellar articles with 3 apical spines; antenna 2, peduncle segments 4 and 5 elongate, 13 flagellar articles; pereonites 1-4 differ little in shape but appreciably in length, anterolateral margins acute; pereonites 5-7 expanded, pereonite 5 largest, anterolateral margins acute in females, rounded in males; pereopod 1 feeble, basis, ischium, and carpus elongate, merus reduced, quadrangular; pereopods 2-4, margins spinous, dactyl elongate; pereopods 5-7 diminishing slightly in size posteriorly, basis large, oblong, merus small, quadrangular, carpus large, oblong, margins spinose; propodus oblong, lamelliform with slender spines, dactyl styliform with 3 apical bristles; uropods uniramous, distal segment longer than proximal, with 6 apical setae and 1 on each lateral margin; female operculum ovate, few setae on lateral margins, male operculum is bilobed, elongate, 8 apical setae; pleotelson apically rounded in females, broader in male, almost semicircular; female 2.2-2.4 mm, male slightly smaller.

Distribution: Beaufort Sea; Frobisher Bay; coastal waters of Norway; Christiania Fjord; west of Ireland.

References: Sars 1899; Richardson 1905; Wolff 1962.

Desmosoma tenuimanum (G.O. Sars 1865) Plates XXIII-XXV

Body slender, elongate; antenna 1, 3 flagellar articles, 3 short and 1 long setae apically; antenna 2, 7 flagellar articles, peduncle segments 4 and 5 elongate; pereon divided into anterior and posterior sections by a well marked constriction, anterior half slightly wider than posterior; pereonites 1-4, anterolateral margins acute; pereonites 1 and 4 slightly reduced in size compared with pereonites 2 and 3; pereonite 5 rounded quadrangular, lateral margins straight; pereonites 6 and 7, lateral margins convex, triangular in shape; pereopod 1 feeble, basis, carpus, and propodus elongate with few setae, merus reduced; pereopods 2-4 with many spiniform processes on carpus and propodus; pereopods 5-7, carpus and propodus elongate bearing long spines and setae, carpus reduced; uropods biramous, inner ramus elongate, outer ramus one-third length of inner with 4 apical spines; operculum ovate, lateral margins

setose; pleotelson tear-shaped with 3 apical setae and 4 on each lateral margin; female 2.3-2.5 mm.

Distribution: Beaufort Sea; Brevoort Island waters, N.W.T.; coastal waters of Norway; Christiania Fjord to Lofoten Islands.

References: Sars 1899.

FAMILY: EURYCOPIDAE

Diagnosis: body oval to oblong; eyes absent; cephalon usually separated from first pereonite, large, deeply emarginate on either side of frontal process; antenna 1, flagellum multiarticulate; antenna 2 elongate, bases separated by produced frontal margin; pereonites 1-4 short, subequal; pereonites 5-7 large, broad; pereopods 1-4 ambulatory, (pereopod 1 may be prehensile); pereopods 5-7 natatory; pereopod 1 shortest; uropods uni- or biramous, always ventral.

References: Wolff 1962.

Eurycope pygmaea G.O. Sars 1869 Plates XXVI-XXVIII

Body ovate, greatest width occurs mid-pereon; cephalon broadens slightly distally, frontal margin truncate with lateral corners acute; antenna 1 shorter than antenna 2; antenna 1, peduncle segment 3 reduced, 5 flagellar articles, 3 spines and 1 seta apically; antenna 2 slightly longer than total body length, numerous flagellar articles; pereonite 1 smallest, anterolateral margins acute; pereonite 2, anterolateral margins rounded; pereonites 3 and 4 anterolateral margins acute; pereonites 5 and 6 partially fused; pereonite 7 triangular; pereopod 1, propodus half length of carpus, dactyl elongate, slightly reflexed; pereopods 2-4 slightly longer than total body length, basis, carpus, and propodus elongate, dactyl curved; pereopods 5-7, carpus and propodus oval, carpus twice size of propodus, lateral margins with plumose setae, dactyl broad, fusiform, margins serrated; pleotelson triangular, truncated apically, laterally setose; female operculum rounded, 2 apical setae; uropods biramous, outer ramus scarcely half length of inner, 3 apical setae, inner ramus with 9 setae, 1 long spine extends from uropod base; female 1.3-1.5 mm.

Distribution: Beaufort Sea; Frobisher Bay; Lofoten Islands; W. Norway.

References: Sars 1899; Richardson 1905; Yashnov 1948; Wolff 1962; Wilson and Hessler 1981.

Munnopsurus giganteus (G.O. Sars 1877) Plates XXIX-XXXII
(=Eurycope gigantea Sars)

Body oblong, arcuate in appearance; anterior pereonites (1-4) shorter and separated by marked constriction from longer posterior pereonites (5-7); cephalon with no frontal projection, oral region protrudes, laterally emarginate; antenna 1 reduced, peduncle segment 1 usually large, flattened, peduncle segments 2 and 3, reduced, flagellum flexible, multiarticulate, posterior margin setose; antenna 2 several times body length, first 3 peduncle

segments short, irregular form, peduncle segments 4 and 5 elongate, flagellum multiarticulate; pereonite 1 reduced; pereonites 2-4 uniformly rounded coxae; pereonites 5-7, similar, longer than anterior pereonites, coxae with anterolateral margin acute; pereonites 5-7 produced on either side of dorsal median line; pereopod 1 small, feeble, carpus elongate, anterior margin setose, dactyl rudimentary; pereopods 2-4 up to twice body length, ambulatory, uniform in appearance, carpus and propodus elongate; pereopods 2 and 3, dactyl falciform; pereopod 4, dactyl straight; pereopods 5-7 uniform in appearance, dactyl small, styliform, concealed among plumose setae; pleotelson large, ovate, arched lateral margins, emarginate apically; operculum large, arcuate, medial carina, margins smooth; uropods small, biramous, outer ramus shorter than inner; female up to 33 mm.

Distribution: Beaufort Sea; Greenland Sea; Barents, Kara, Laptev and East Siberian Seas; Spitsbergen; West Greenland Sea; Chukchi Sea; Iceland; W. Norway; Bering Sea; Sea of Okhotsk.

References: Sars 1885, 1900; Stappers 1911; Hansen 1916; Gurjanova 1933, 1934, 1936; Yashnov 1948; Wolff 1962; Kussakin 1973.

FAMILY: ILYARACHNIDAE

Diagnosis: Body oblong; cephalon large, broad, truncate on frontal margin; antenna 1 short, bases very close together on frontal margin, peduncle segment 1 plate-shaped; antenna 2 longer than body length; pereopod 1 small; pereopod 1 and 2 somewhat prehensile; pereopods 3 and 4 ambulatory, slender, elongate; pereopods 5-6 natatory, dactyl present; pereopods 3 and 4, basis shorter than for pereopods 1 and 2; pereopod 7 ambulatory or natatory; pereonites 1-4 crowded together, slightly excavated transversely; pereonites 5-7 large, convex; uropods usually uniramous, ventral.

References: Hansen 1916; Wolff 1962; Thistle and Hessler 1976.

Ilyarachna sp. G.O. Sars 1863

Body robust, no distinct frontal area; pereopod 1 and 2 similar, not appreciably different in size; pereopod 3 and 4 distinctly longer than pereopod 1 and 2; pereopod 5 and 6 almost equal, carpus large and expanded, propodus much narrower and oblong, dactyl well developed; pereopod 7 much narrower than pereopod 5 and 6, plumose setae almost always present on all segments, dactyl elongate; female operculum oblong, median keel, densely setose along distal margins; uropods small; pleotelson triangular.

References: Sars 1899; Wolff 1962; Thistle 1980.

FAMILY: MACROSTYLIDAE

Diagnosis: Body narrow, subdivided between pereonites 3 and 4; 4 anterior pereonites densely crowded together; cephalon large, triangular, frontal margin produced; eyes absent; antenna 1 very short, flagellum rudimentary; antenna 2,

peduncle segments 1-3 short, peduncle segments 4 and 5 elongate; pereopods short, ambulatory; uropods uniramous, styliform.

References: Hansen 1916; Wolff 1962.

Macrostylis spinifera G.O. Sars 1864 Plates XXXIII-XXXV

Body elongate, slender; cephalon broadens at base, slightly sinuated laterally at antennal insertion, frontal margin produced, obtuse at tip; antenna 1 much shorter than antenna 2; antenna 2, 7 flagellar articles; pereonite 3 largest; pereonites 1-3 lateral margins smooth; pereonites 4-7, posterolateral margins acute; pereopods 1 and 2 similar, propodus posterior margin serrated with 2 spines; pereopod 3, ischium anteriorly produced to a recurved spiniform process bearing 5 long spines, merus lamelliform with a dense row of slender spines on anterior margin, carpus with 6 spines on anterior margin, propodus slightly serrated, dactyl elongate; pereopods 4-7 more slender than pereopods 1-3; pereopod 4 shortest; pereopod 7 longest; dactyl of pereopods 4-7 small, 2 apical setae; uropods uniramous, slender, proximal segment three times length of terminal segment, terminal segment with 4 long apical setae; female operculum with medial keel, lateral margins setose, plumose setae apically; male operculum cleft to 1/4 length; pleotelson rounded quadrangular, oblong, lateral margins sinuated, 10 apical setae; female 2.4-2.5 mm.

Distribution: Beaufort Sea; Christiania Fjord; Norwegian coastal waters to Lofoten Islands; s.w. Iceland; Davis Strait; Scotland.

References: Sars 1899; Hansen 1916; Wolff 1962.

FAMILY: MUNNIDAE

Diagnosis: body short and stout; first 4 pereonites larger than the 3 posterior pereonites; eyes, when present, on lateral tips of cephalon; antenna 1 placed widely apart, flagellum multiarticulate; antenna 2 immmediately beneath antenna 1; pereopod 1 shortest, prehensile, remaining pereopods simple, ambulatory, and increasing in length posteriorly; pleotelson with two pleonites.

References: Sars 1899.

Munna kroeyeri Goodsir 1842 Plates XXXVI-XXXVII

Body stout, short, tapering slightly posteriorly (male more slender than female); eyes small, set on lateral margins of cephalon, conically tapered; cephalon broad, frontal margin obtusely produced, blunt; antenna 1 very short, flagellum with three articulations, 1st article short, 2nd elongate, 3rd (terminal) very small; antenna 2 elongated, peduncle segments 4 and 5 long and slender, flagellum shorter than peduncle; 4 anterior pereonites broad, distinctly marked off from each other; 3 posterior pereonites smaller, all pereonites with lateral margins setose; pereopod 1 shortest, prehensile; remaining pereopods simple, ambulatory, increasing in length posteriorly; uropod small, subdorsal, posterolateral processes produced apically to 3-4

dentiform projections, posteriormost hook-like; pleotelson pear-shaped, 4 pairs lateral spines - posteriormost subdorsal, apex blunt; color pale yellow, mottled with brown; female up to 3.0 mm.

Distribution: Beaufort Sea; British Columbia (False Narrows, Gabriola Pass, Horswell Point); Seattle, Washington; Pacific coast; Arctic arch-ipelago; upper Frobisher Bay; British Isles; North Atlantic from English Channel to Norway; Godthaab and Upernivik, Greenland; Southern Iceland; Western Baltic; Barents Sea; Kattegat.

References: Sars 1899, 1909; Richardson 1900a, 1901, 1905; Hansen 1916; Fee 1927; Gurjanova 1933, 1934; Hatch 1947; Yashnov 1948; Wolff 1962; Wacasey et al. 1979.

FAMILY: MUNNOPSIDAE

Diagnosis: body compact, 2 divisions of pereon sharply defined; eyes absent; antenna 1 shorter than antenna 2; antenna 1, peduncle segment 1 large, broad, flagellum well developed; antenna 2 very elongate; pereopod 1 smallest, never subchelate; pereopods 2-4 elongate, ambulatory; pereopods 5-7 natatory, dactyl absent; uropods uniramous, usually terminal.

References: Richardson 1900b; Hansen 1916; Wolff 1962.

Munnopsis typica M. Sars 1860 Plates XXXVIII-XLI

Body narrow, elongate; eyes absent; antenna 1, peduncle segment 1 large, numerous flagellar articles; antenna 2, peduncle segments 4 and 5 elongate, flagellum length shorter than combined peduncle length, antenna 2 elongated to several times the body length; pereonites 1-4 broad, lateral margins rounded; pereonites 5-7 narrower and longer than anterior pereonites; cephalon sunken within pereonite 1 with 2 juxtaposed tubercles above base, frontal margin truncate; pereonites 1-4 separated by smooth, thin skinned constrictions, lateral margins each with oval protuberence on dorsal surface; pereonites 6-7 with 2 juxtaposed tubercles on dorsal surface situated on either side of median line; pereonites 5 and 6, posterolateral margins acute; coxae distinct, small; pereopods 1-4 ambulatory; pereopods 5-7 natatory, dactyl absent; pereopod 1 shortest, merus reduced; pereopod 2 slightly longer than pereopod 1, carpus elongate, posterior margin spinous, dactyl elongate; pereopods 3 and 4 elongated to several times the body length, carpus and propodus elongate, dactyl slender; pereopod 3, propodus with 5 spines on margin adjacent to dactyl; dactyl long, reflexed; female operculum ovate with longitudinal median keel; male operculum evaginate apically with copulatory stylets extending from the second pleopod at sexual maturity; operculum with setae in both sexes; uropods uniramous, setose; pleotelson (exceeds length of pereonites 5-7 combined) narrow, ovate with a pointed anterior margin, lateral margins smooth; male 15-16.0 mm, females appear larger due to inflated marsupium.

Distribution: Beaufort Sea; Arctic Ocean; Baffin Bay; Davis Strait; Gulf of St. Lawrence; between Norway and Iceland; Christiania Fjord; Christiania Sound; Spitsbergen; Kara Sea; Lofoten Islands.

References: Weber 1884; Sars 1899; Richardson 1900b, 1901, 1905; Stappers 1911; Hansen 1916; Gurjanova 1934; Yashnov 1948; Naylor 1957b; Wolff 1962.

FAMILY: PLEUROGONIIDAE

Diagnosis: body short, depressed; anterior 4 pereonites larger than 3 posterior pereonites; cephalon small; eyes absent; first pereopod short and strong, remaining slender and increasing in length posteriorly.

References: Sars 1899.

Pleurogonium spinosissimum (G.O. Sars 1866) Plates XLII-XLIII

Body oval, depressed, tapering slightly posteriorly; eyes absent; cephalon small, blunt anteriorly; antenna 1 slightly shorter in length than antenna 2; lateral margins of 4 anterior pereonites with double serrated processes; 3 posterior pereonites smaller than anterior, each with single, strong, serrated process; pereopod 1 shortest, subchelate, dactyl inner margin spinose; remaining pereopods slender, ambulatory, minutely setose, increasing in length posteriorly; uropods biramous, small, located dorsally on pleotelson - anterior to apex, outer ramus 2-3x length of inner; pleotelson large, heart-shaped, lateral margins setose, bulging in the middle, apex acutely produced; female operculum broader, acutely produced apically; color bright red; female up to 3.0 mm.

Distribution: Beaufort Sea; upper Frobisher Bay; Baffin Bay; Davis Strait; coast of Labrador to Cape Cod; Gulf of St. Lawrence; Bay of Fundy; Nova Scotia; western and southern Greenland; British Isles; Norwegian coast (from Christiania Fjord to Vardo); Denmark; Barents Sea; Kara Sea; Kattegat; Skagerrak; Spitsbergen; Franz Josef Land.

References: Sars 1899; Hansen 1916; Wallace 1919; Gurjanova 1933, 1934; Yashnov 1948; Wolff 1962; Denis and Brunel 1973, 1975; Brunel 1975; Levings 1975; Wacasey et al. 1979.

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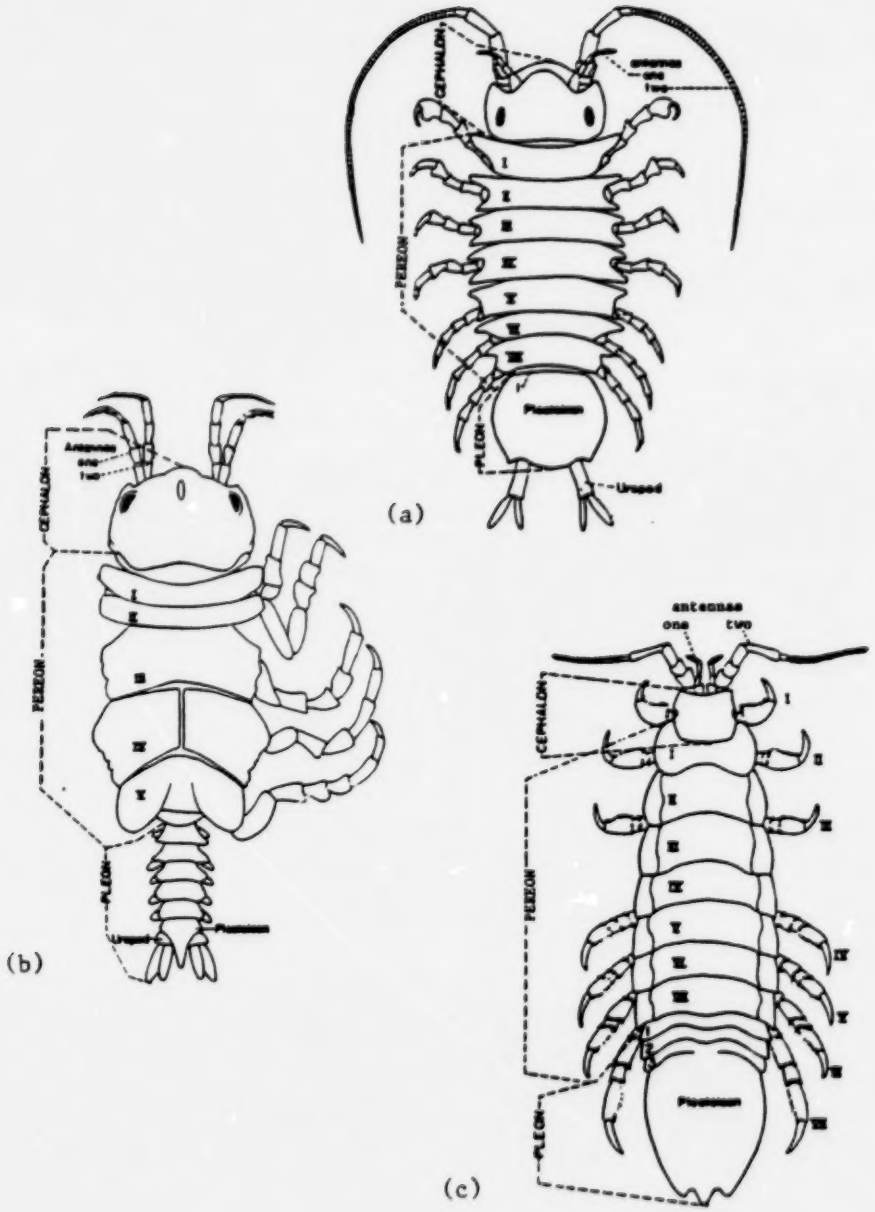
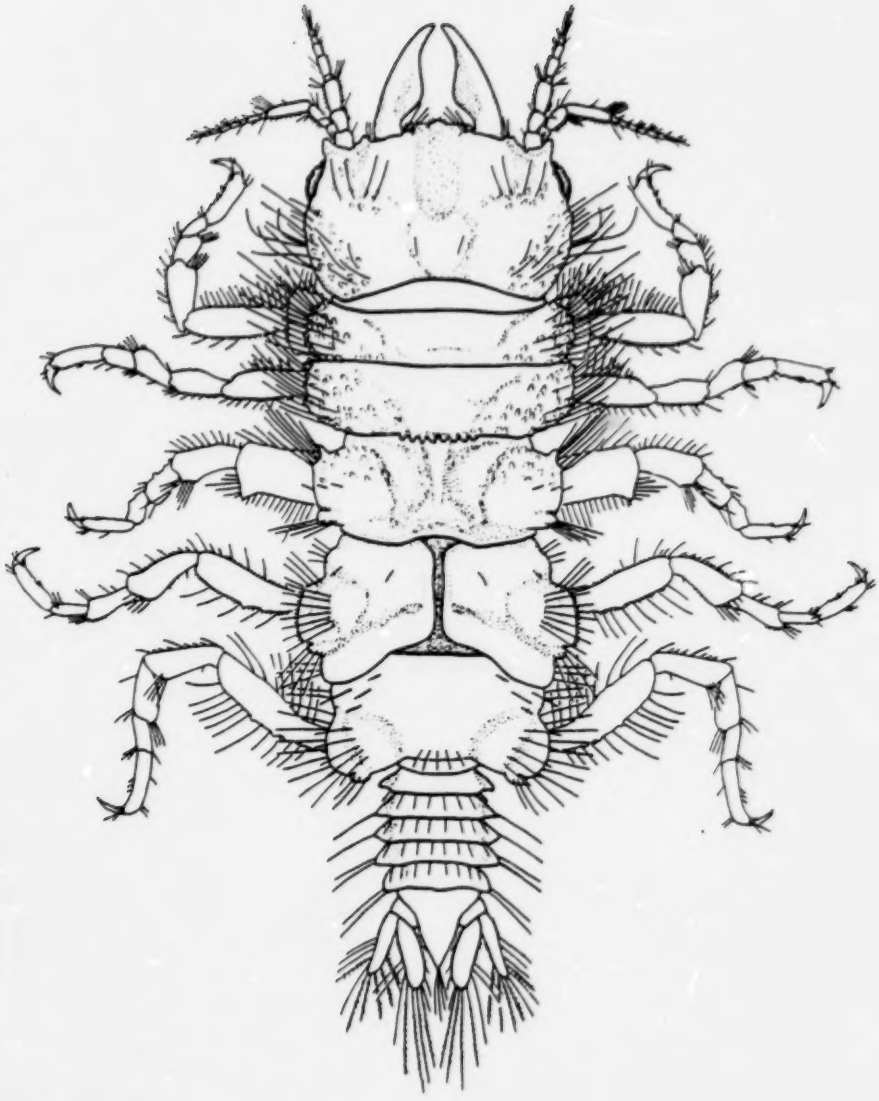
PLATE I



The basic (a) Asellota, (b) Gnathiidea, and (c) Valvifera (modified from Schultz 1969)

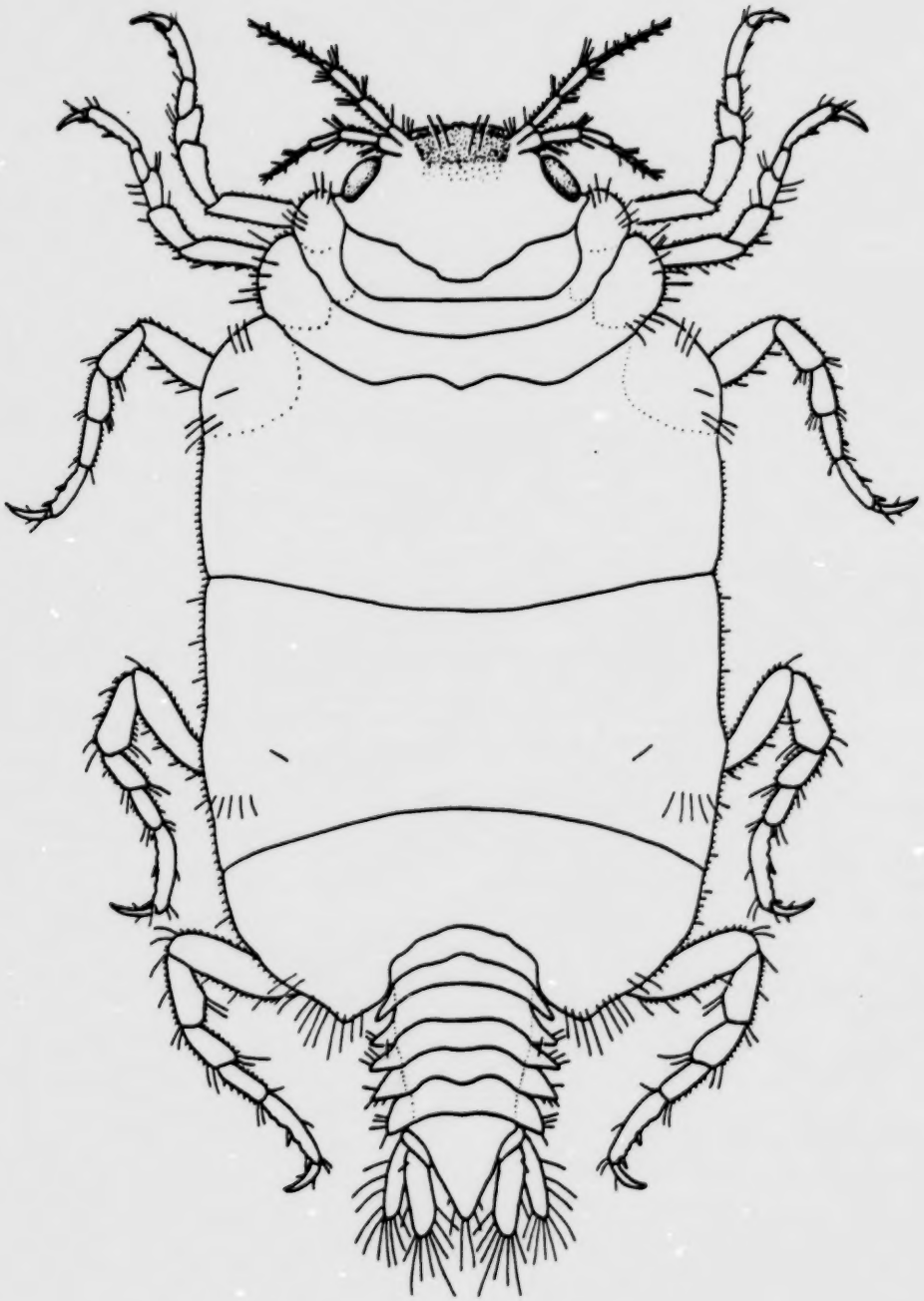
GNATHIIDAE PLATE II



Gnathia elongata (Krøyer 1849) TL = 4.9 mm ♂

GNATHIIDAE

PLATE III

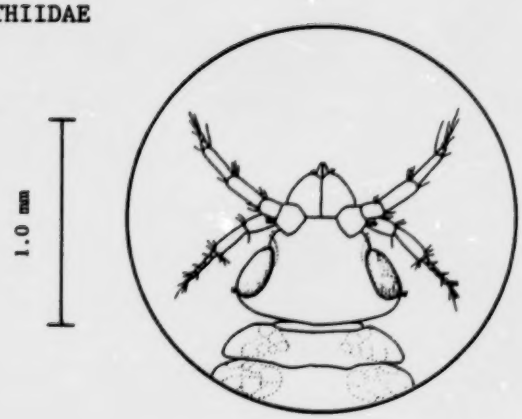


Gnathia elongata (Krøyer 1849)

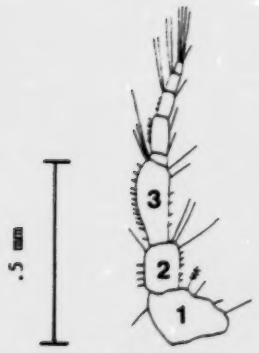
TL = 3.1 mm ♀

GNATHIIDAE

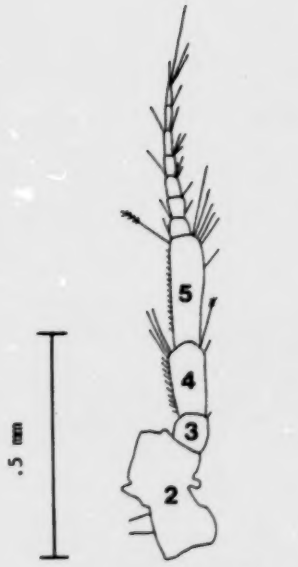
PLATE IV



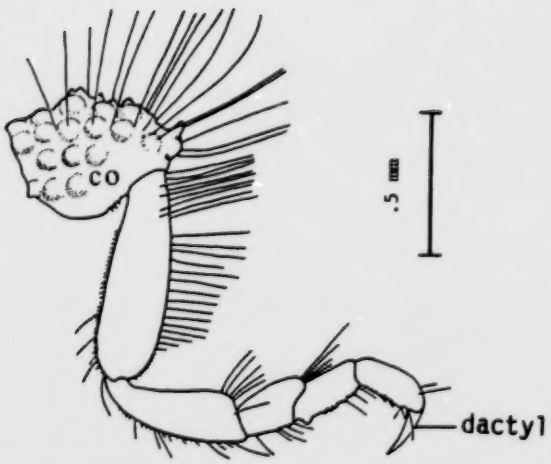
cephalon
juvenile



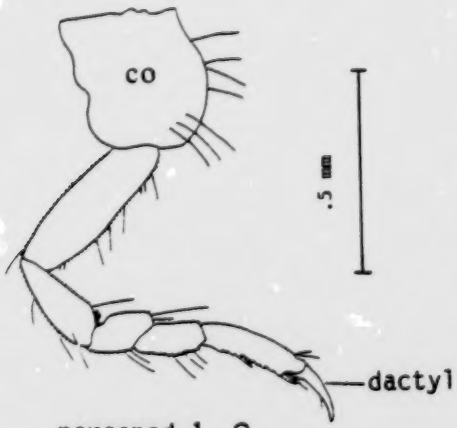
antenna 1 ♂



antenna 2 ♂



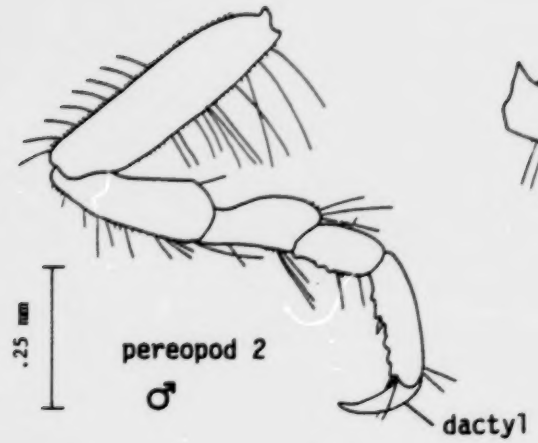
pereopod 1 ♂

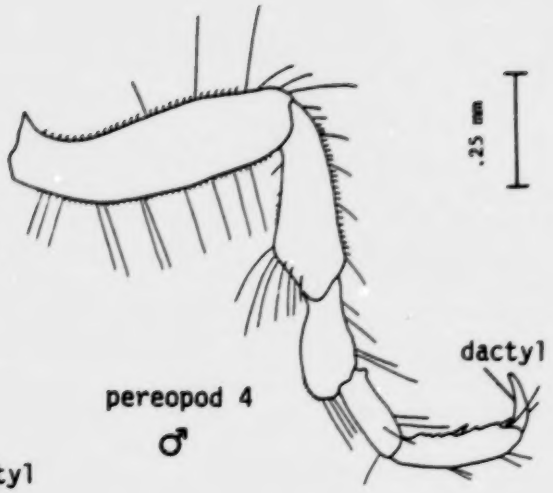


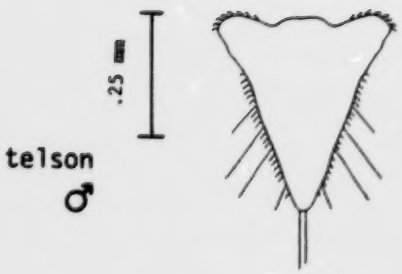
pereopod 1 ♀

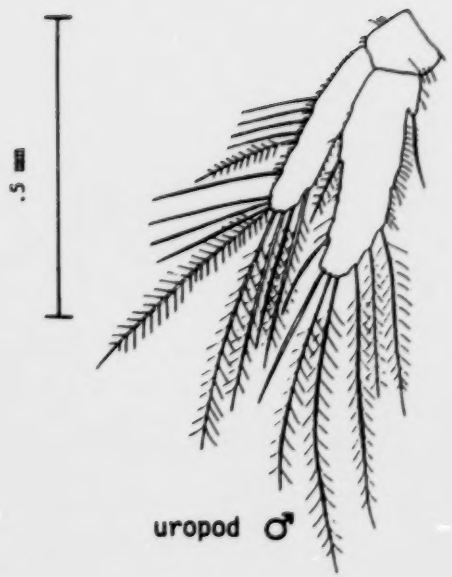
Gnathia elongata (Krøyer 1849)

GNATHIIDAE PLATE V





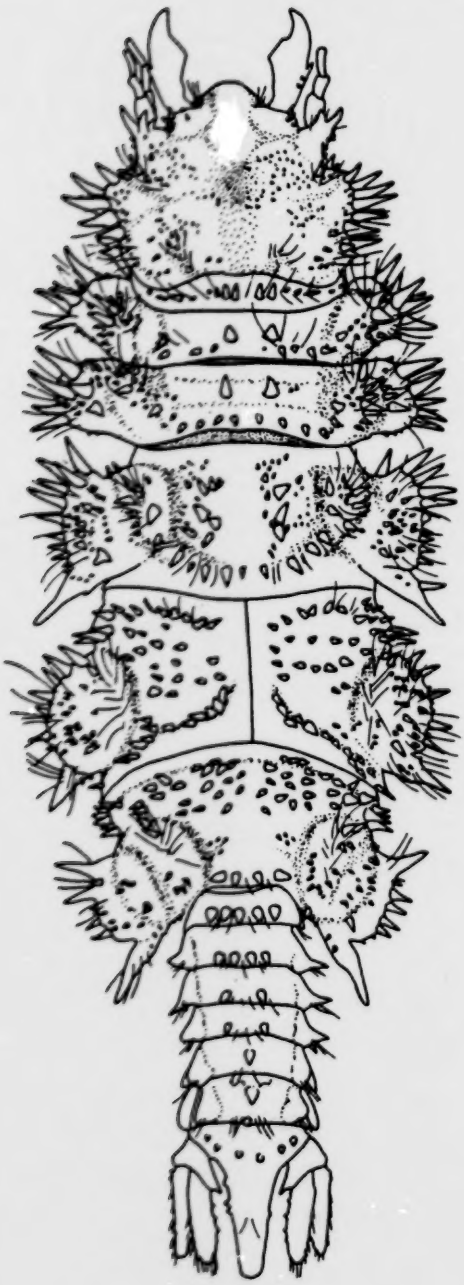




Gnathia elongata (Krøyer 1849)

GNATHIIDAE

PLATE VI

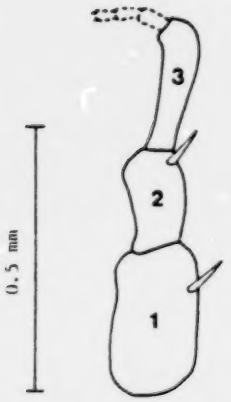


Gnathia stygia (G.O. Sars, 1885)

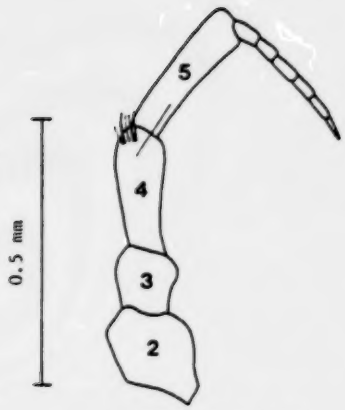
TL = 8.8 mm

GNATHIIDAE

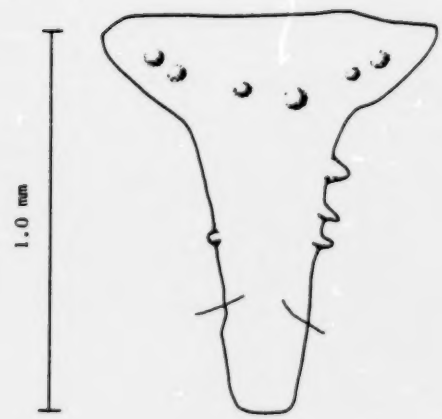
PLATE VII



antenna 1 (dorsal)



antenna 2 (ventral)

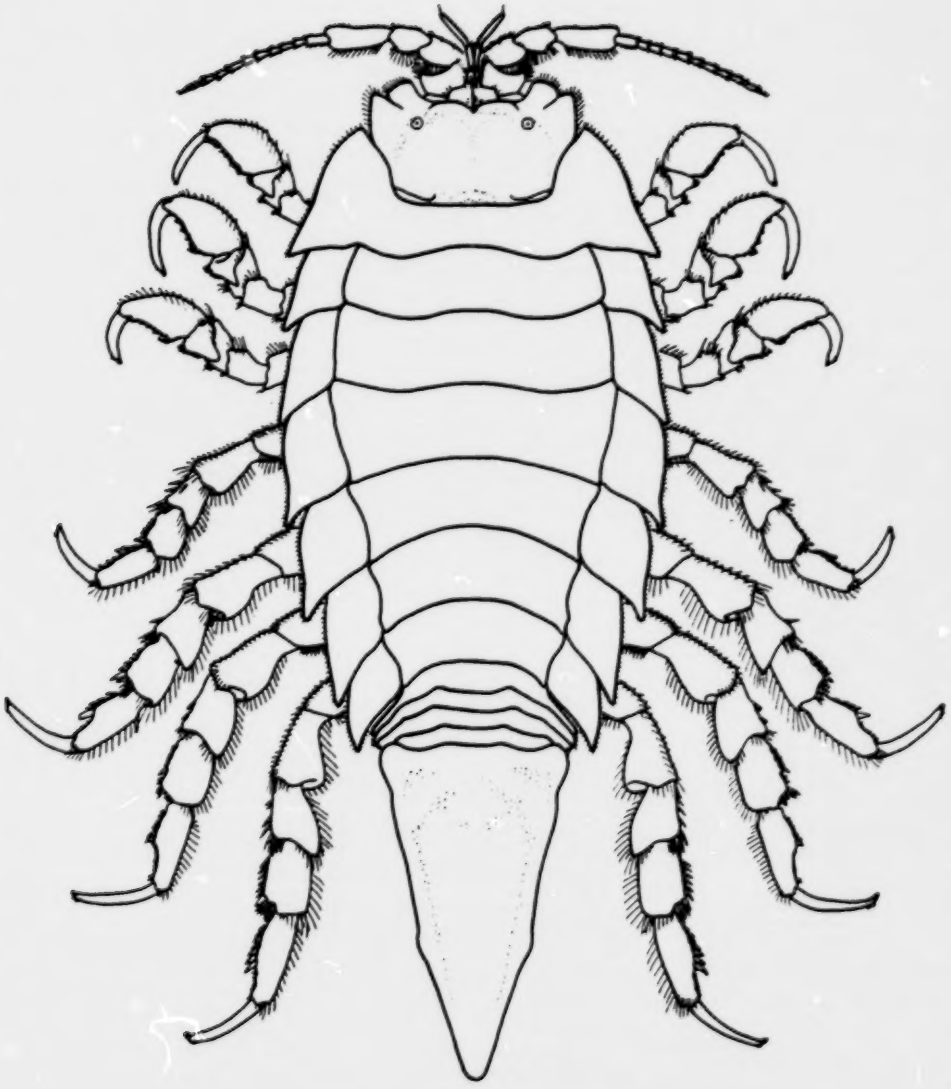


telson

Gnathia stygia (G.O. Sars, 1885)

IDOTEIDAE

PLATE VIII

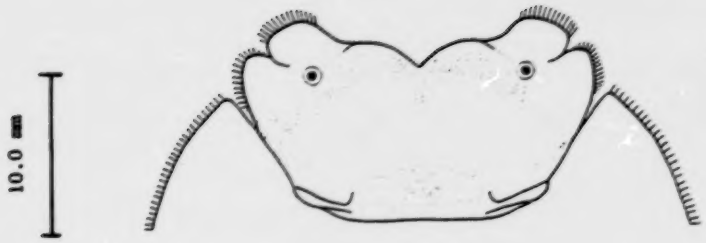


Mesidotea entomon (Linnaeus 1767)

TL = 84 mm ♂

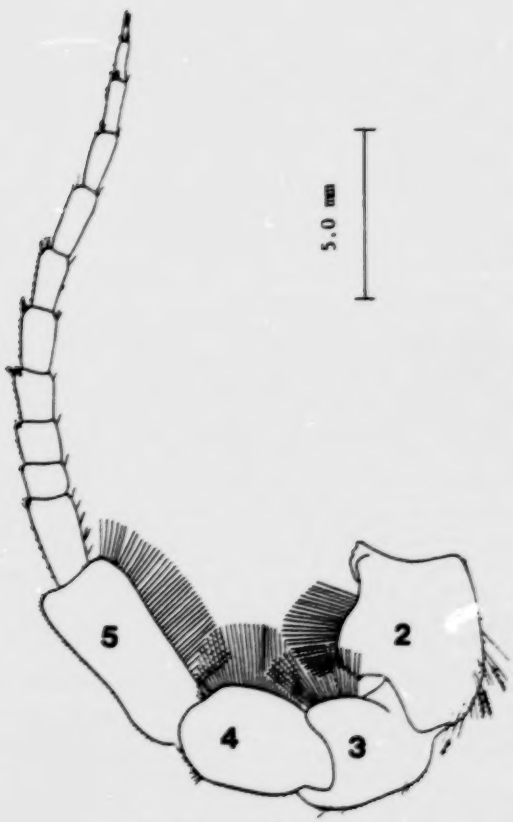
PLATE IX

IDOTEIDAE



cephalon

antenna 1

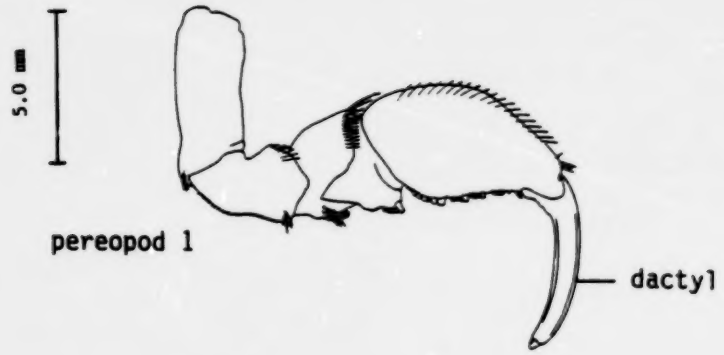


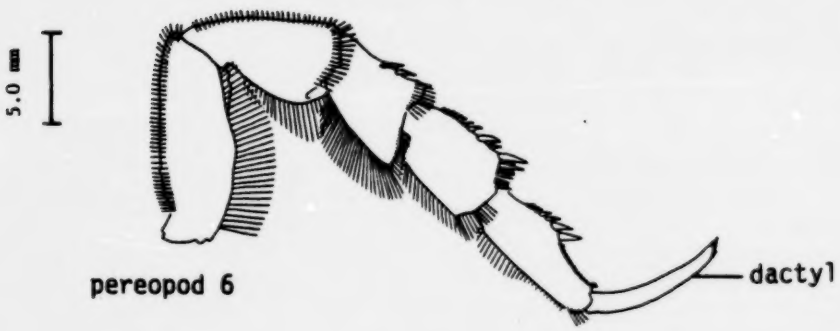
antenna 2

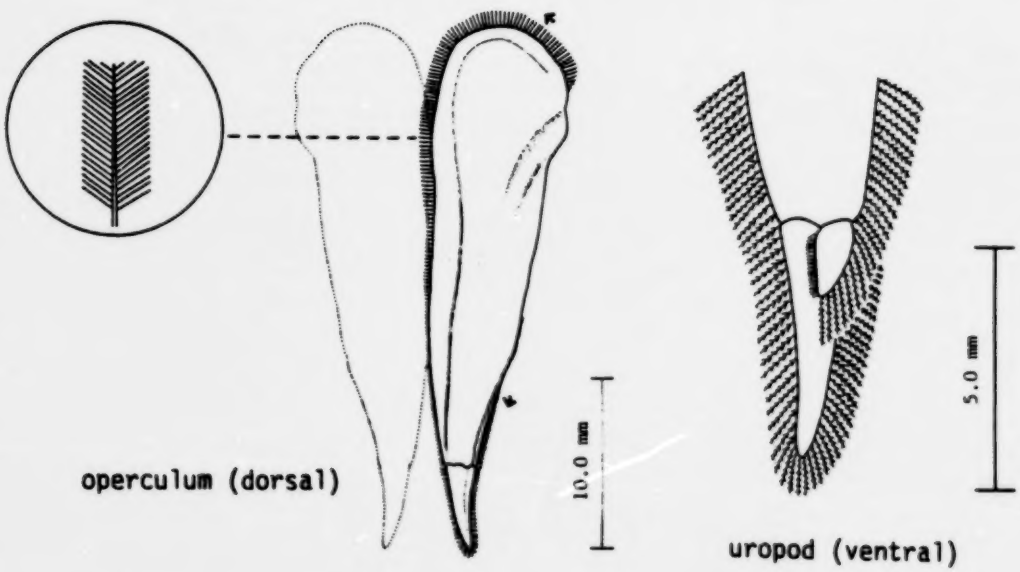
Mesidotea entomon (Linnaeus 1767)

IDOTEIDAE

PLATE X



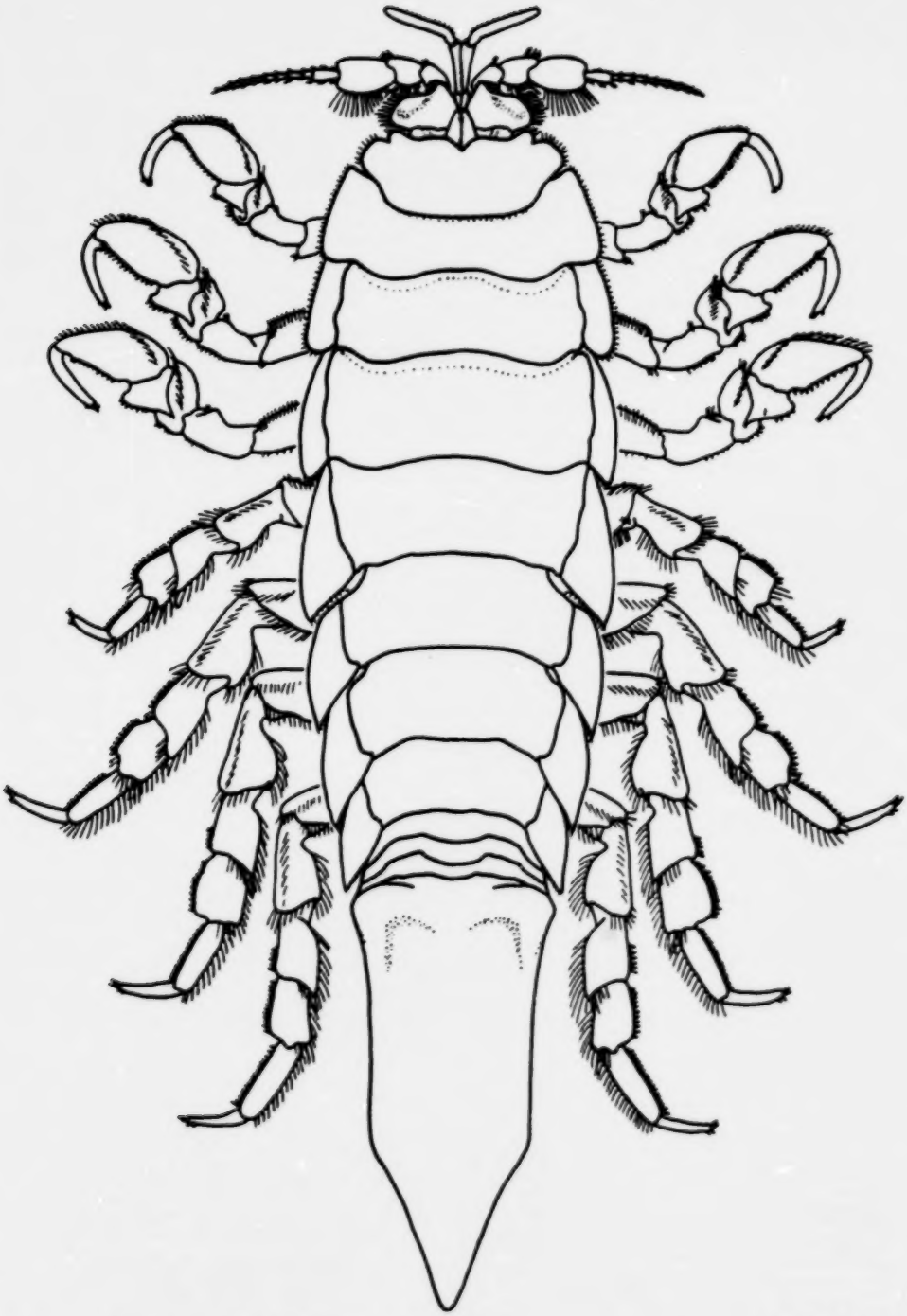




Mesidotea entomon (Linnaeus 1767)

PLATE XI

IDOTEIDAE



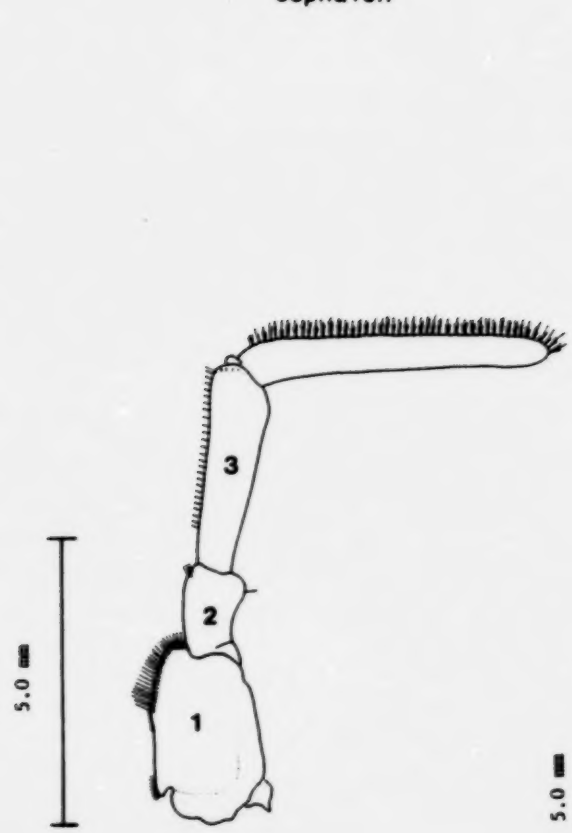
Mesidotea sabini (Krøyer 1849)

TL = 88 mm ♂

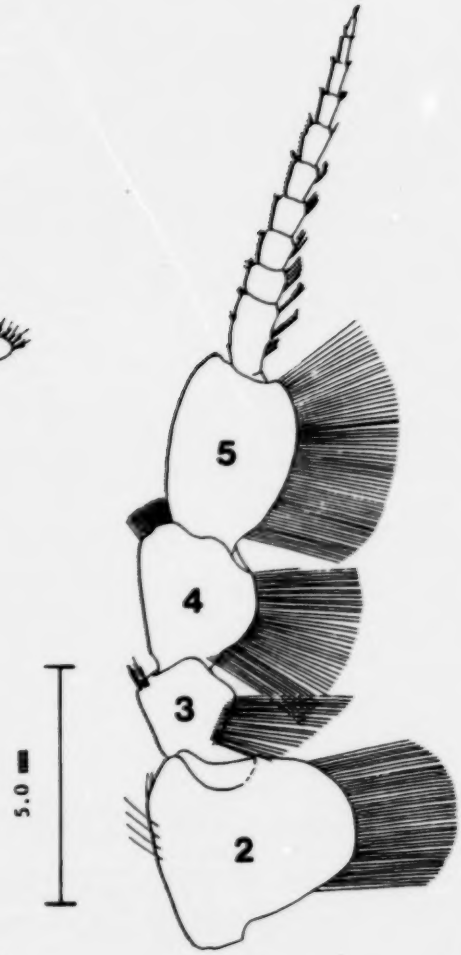
IDOTEIDAE

PLATE XII

cephalon



antenna 1

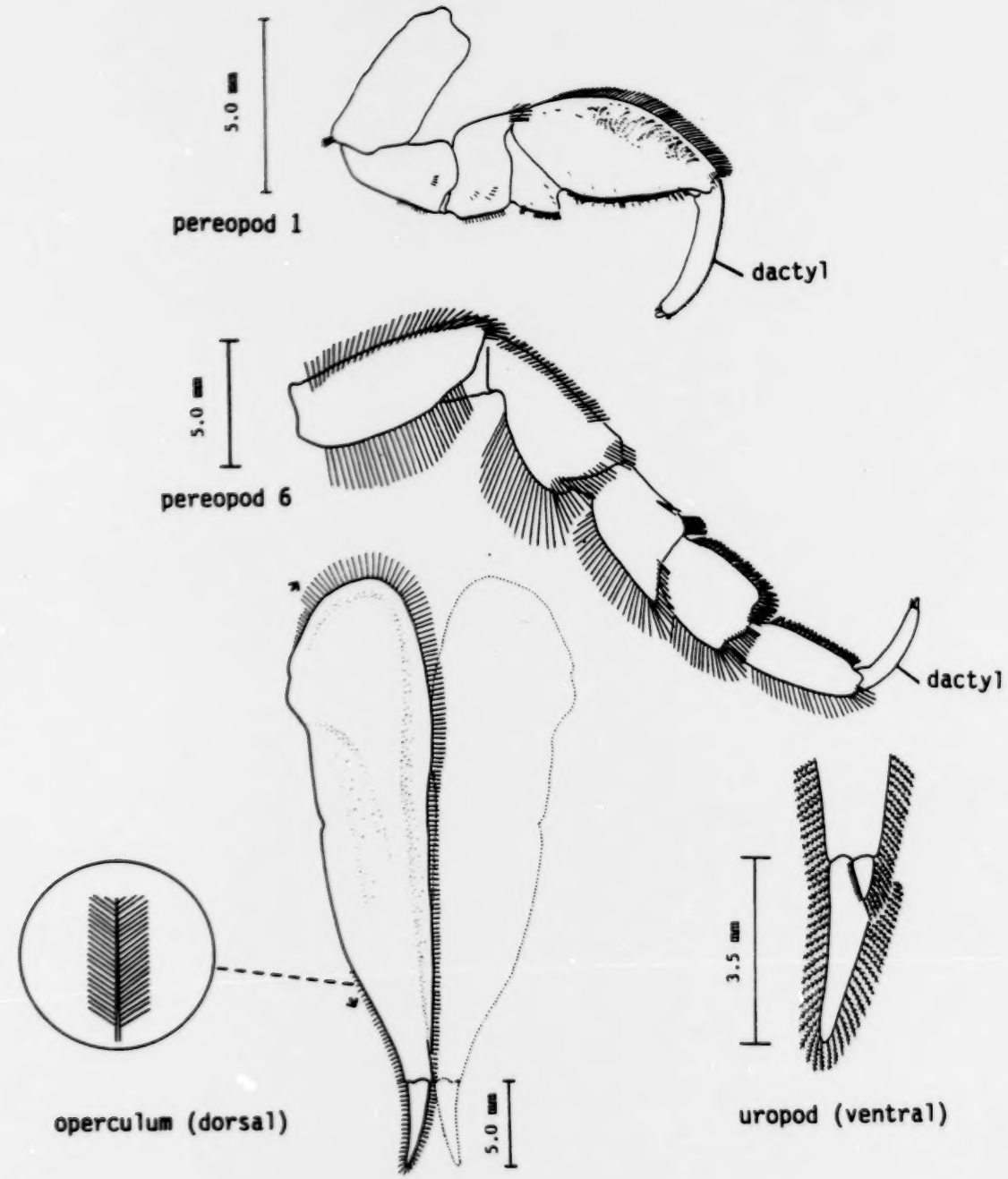


antenna 2

Mesidotea sabini (Krøyer 1849)

IDOTEIDAE

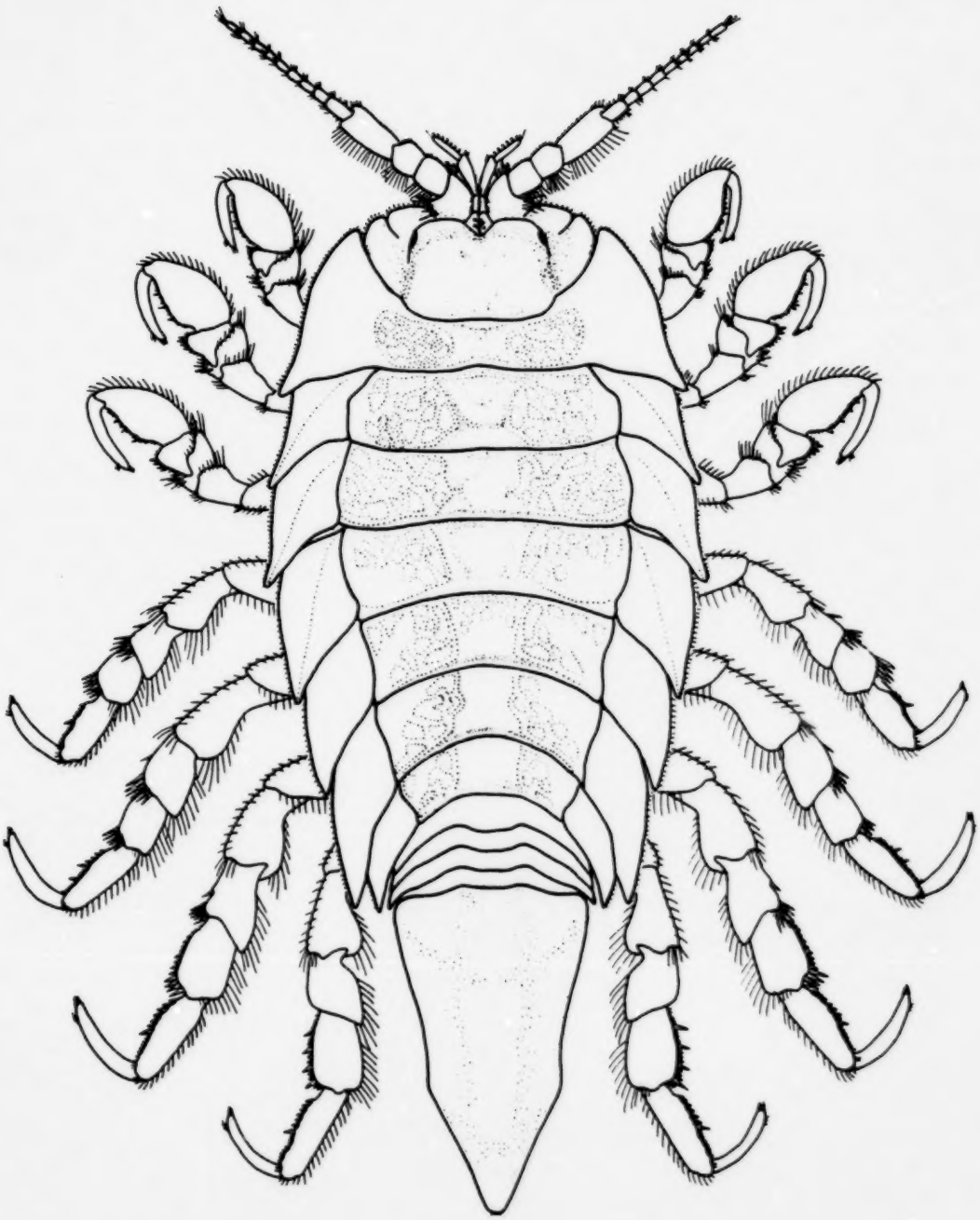
PLATE XIII



Mesidotea sabini (Krøyer 1849)

PLATE XIV

IDOTEIDAE

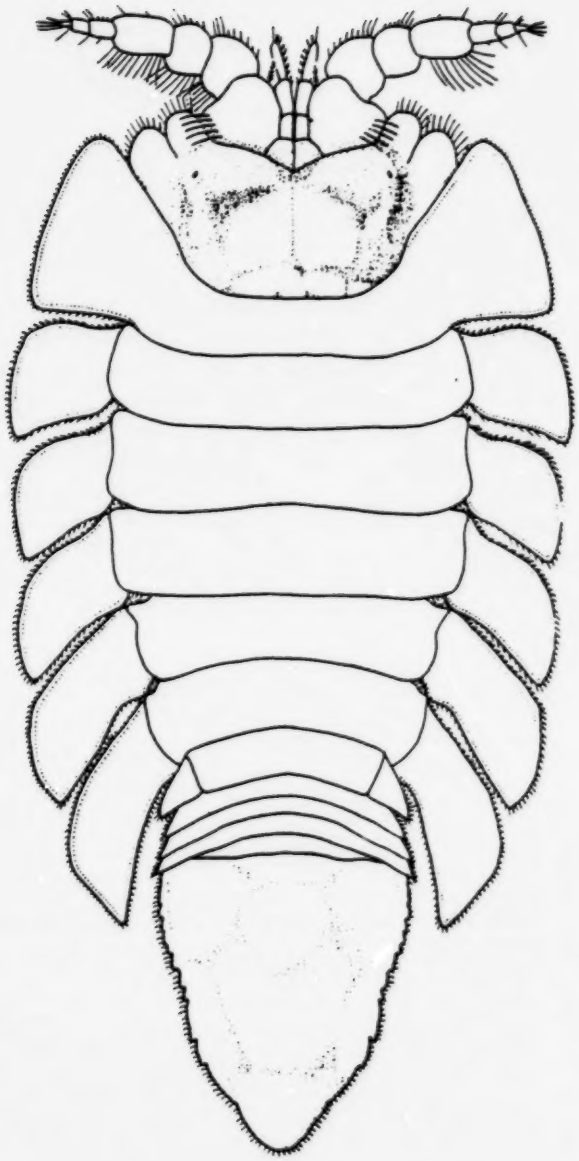


Mesidotea sibirica (Birula 1896)

TL = 72 mm ♂

IDOTEIDAE

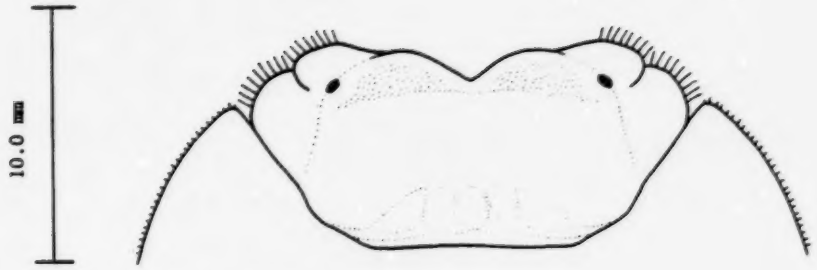
PLATE XV



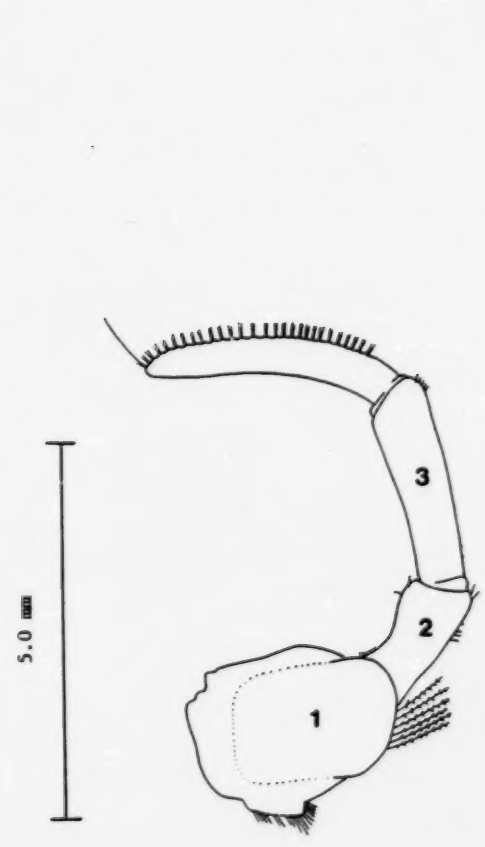
Mesidotea sibirica (Birula 1896) TL = 12.5 mm juv

PLATE XVI

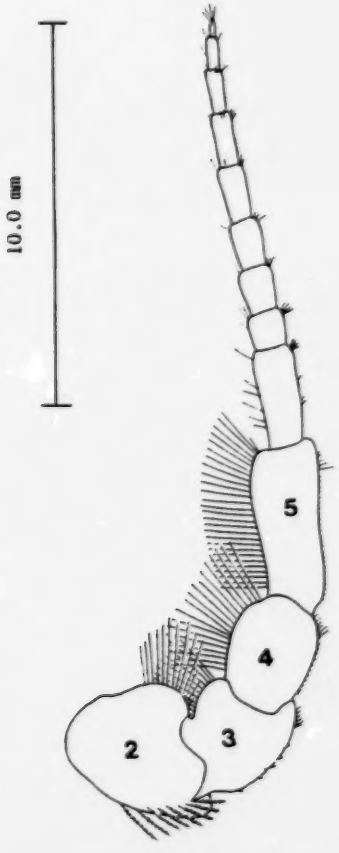
IDOTEIDAE



cephalon



antenna 1

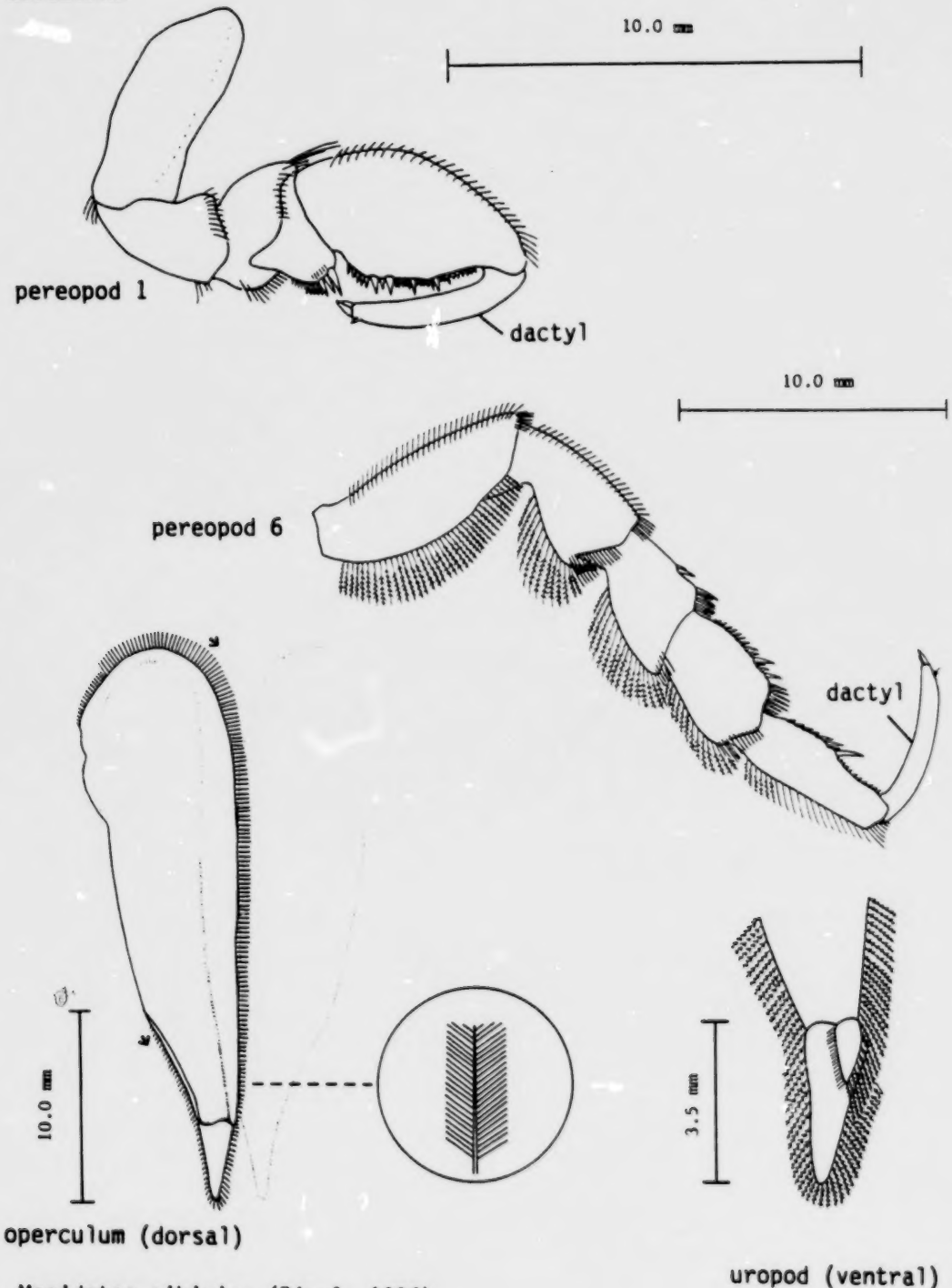


antenna 2

Mesidotea sibirica (Birula 1896)

IDOTEIDAE

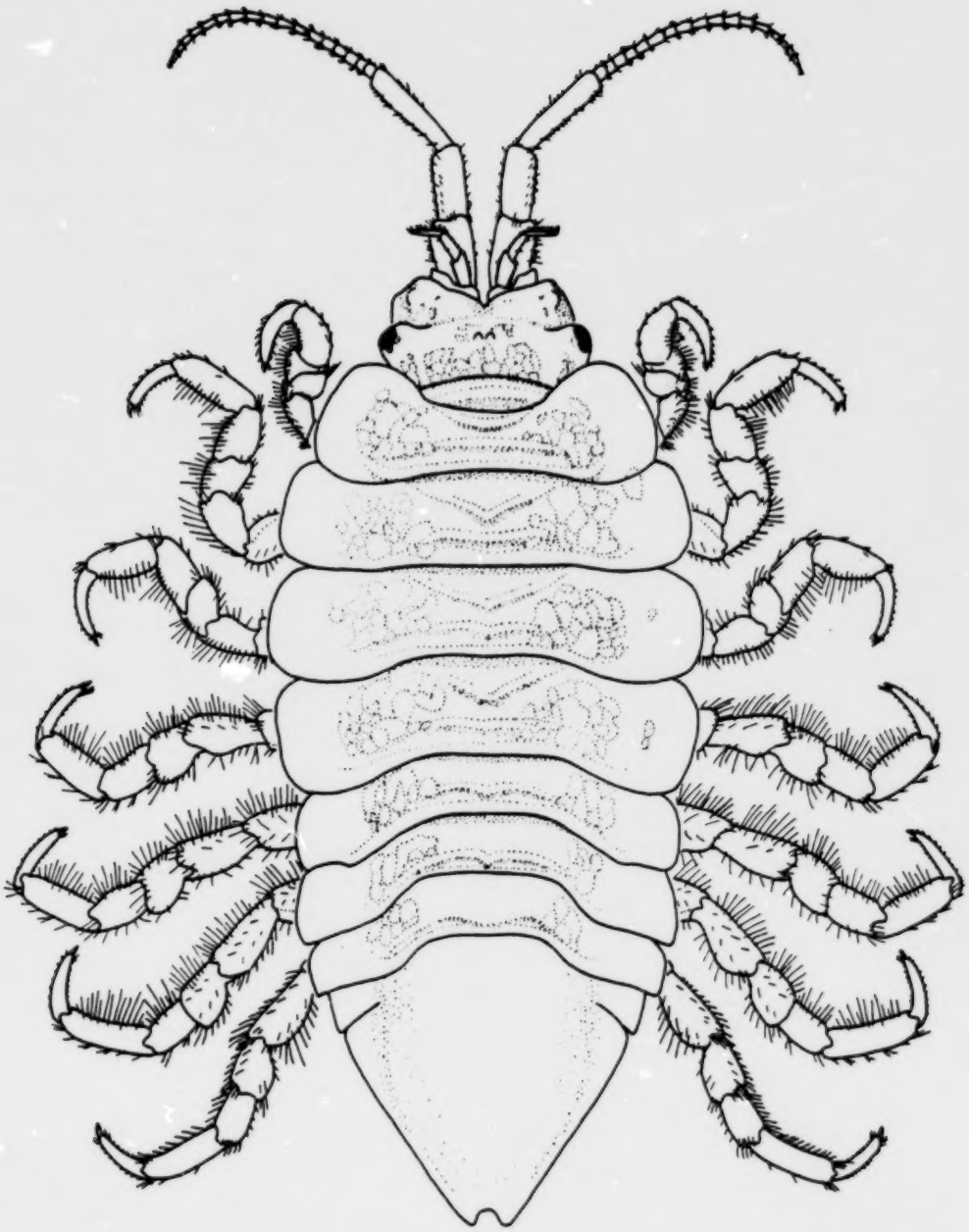
PLATE XVII



Mesidotea sibirica (Birula 1896)

IDOTEIDAE

PLATE XVIII

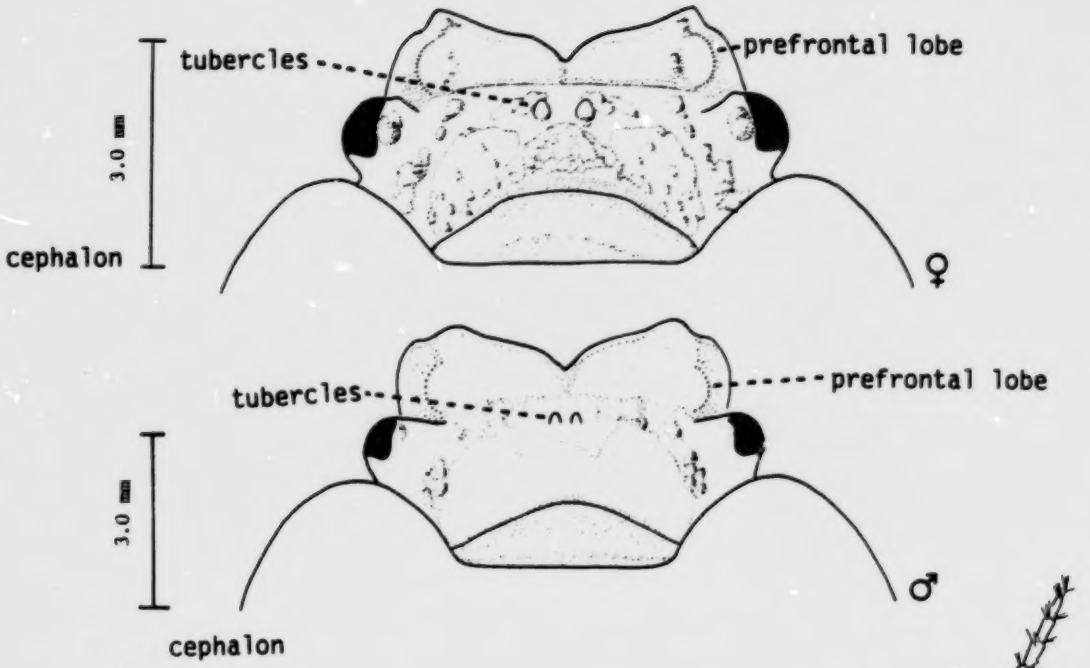


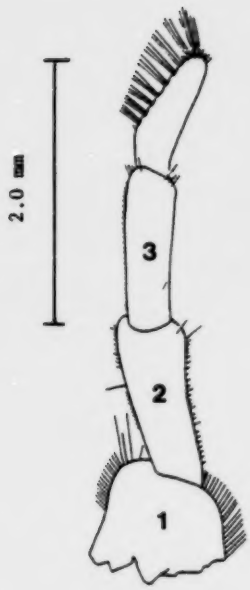
Synidotea bicuspida (Owen 1839)

TL = 28.5 mm ♂

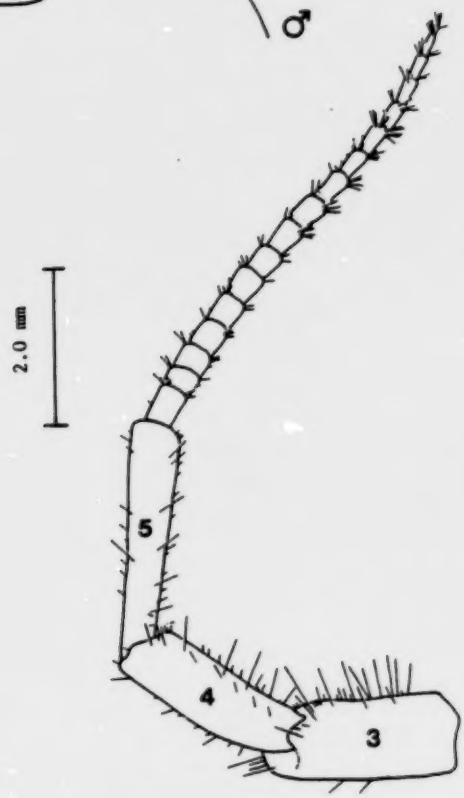
PLATE XIX

IDOTEIDAE





antenna 1

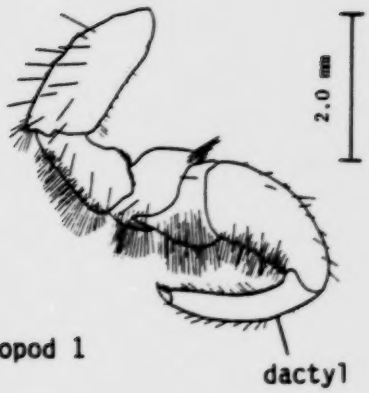


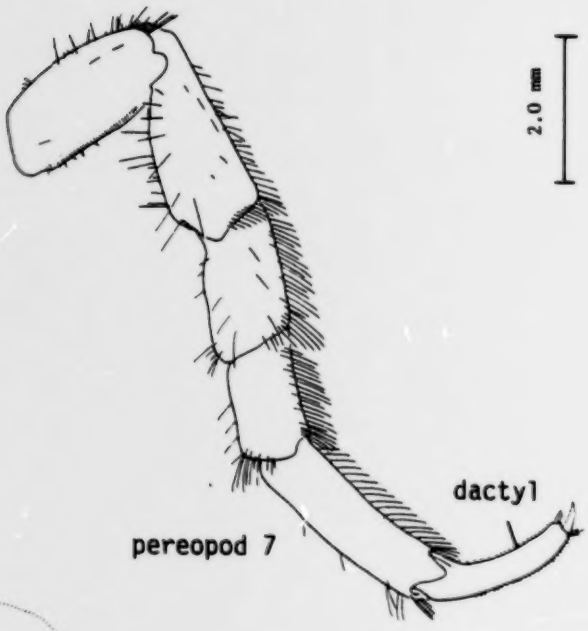
antenna 2

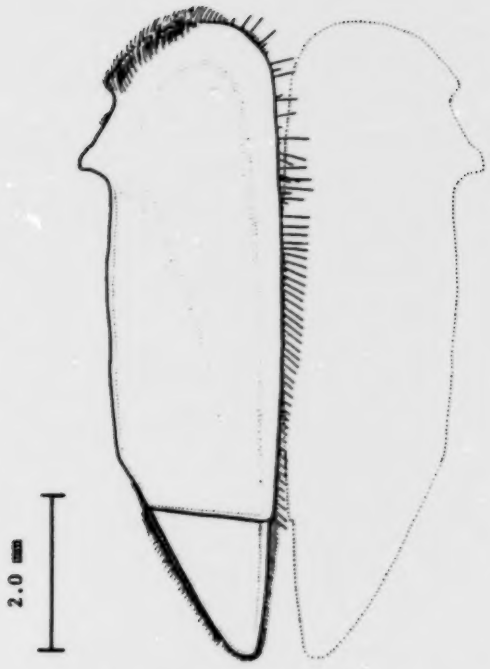
Synidotea bicuspida (Owen 1839)

IDOTEIDAE

PLATE XX



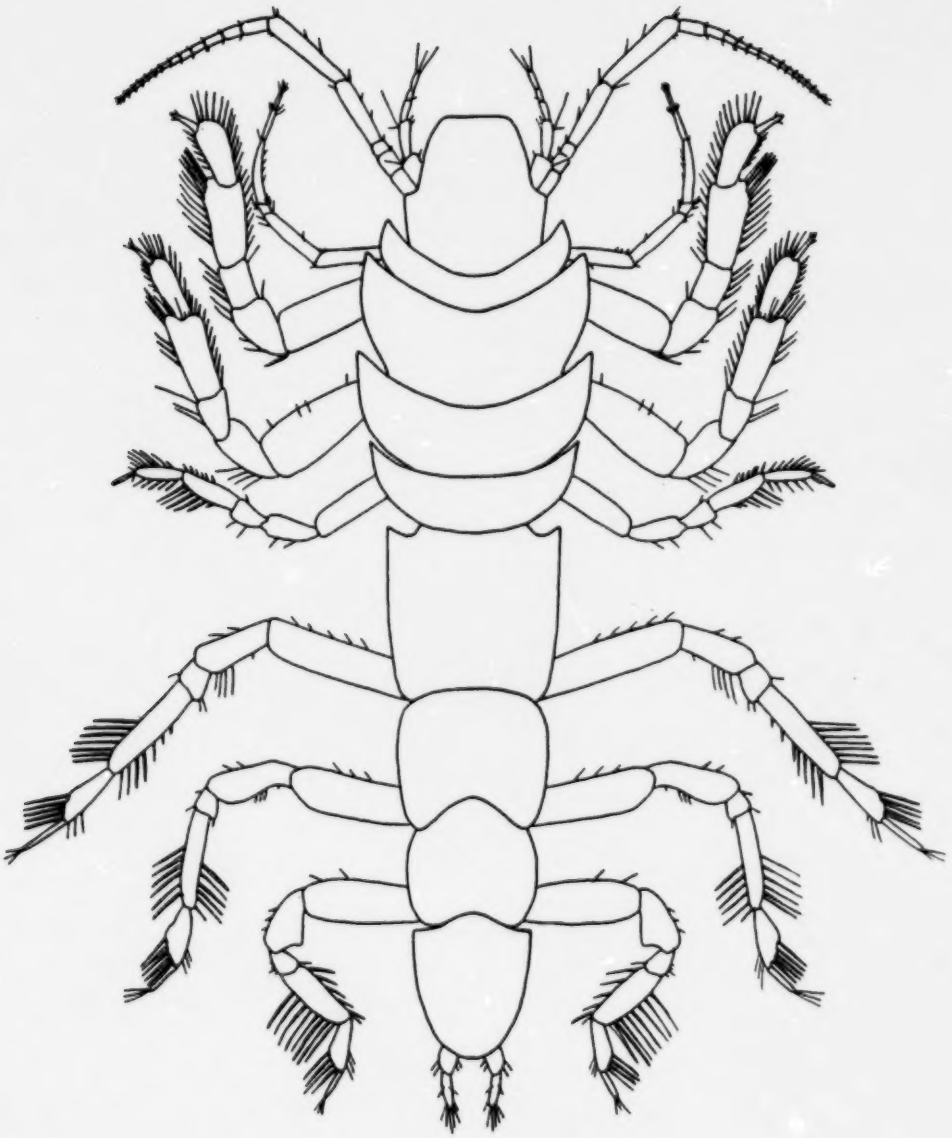




Synidotea bicuspida (Owen 1839)

DESMOSOMATIDAE

PLATE XXI

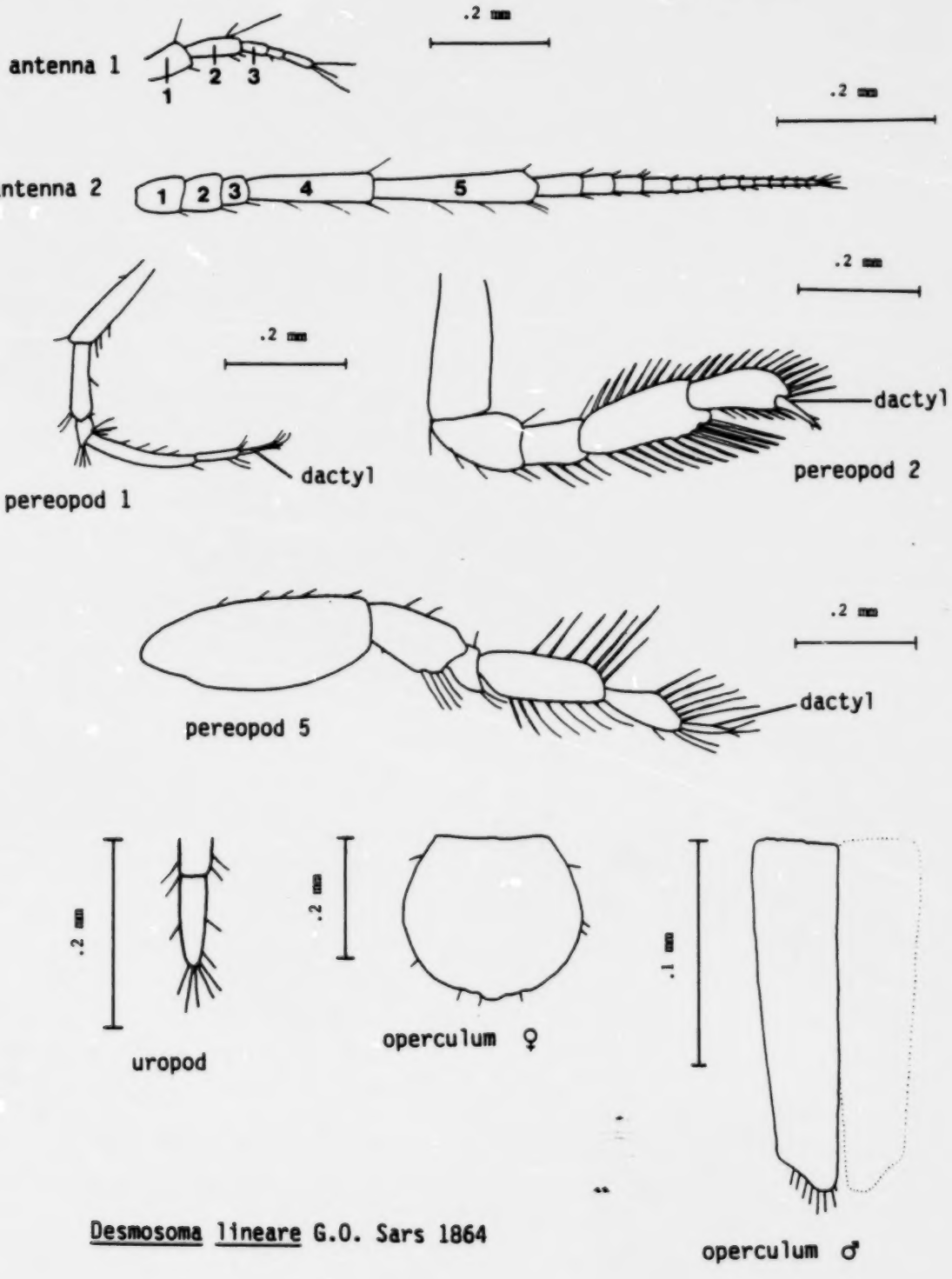


Desmosoma lineare G.O. Sars 1864

TL = 2.31 mm ♀

DESMOSOMATIDAE

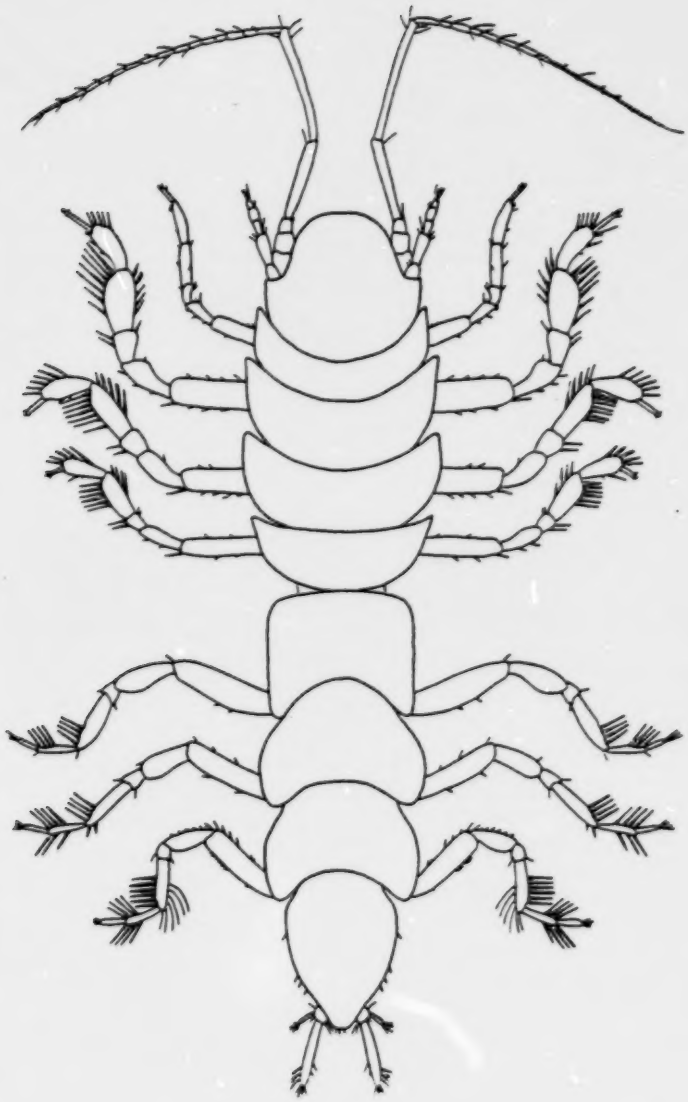
PLATE XXII



Desmosoma lineare G.O. Sars 1864

DESMOSOMATIDAE

PLATE XXIII



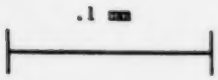
Desmosoma tenuimanum (G.O. Sars 1865)

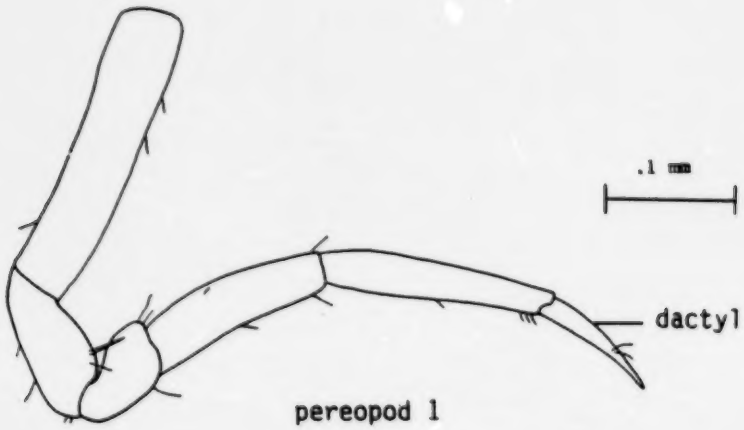
TL = 2.3 mm ♀

DESMOSOMATIDAE

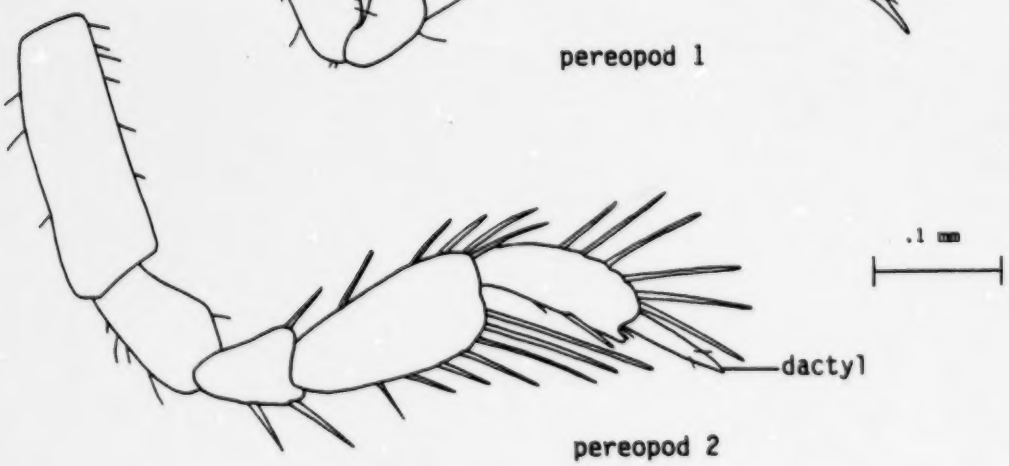
PLATE XXIV

antenna 1





pereopod 1



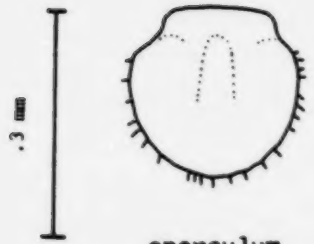
pereopod 2

pereopod 7

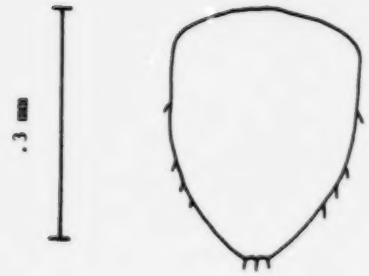
Desmosoma tenuimanum (G.O. Sars 1865)

DESMOSOMATIDAE

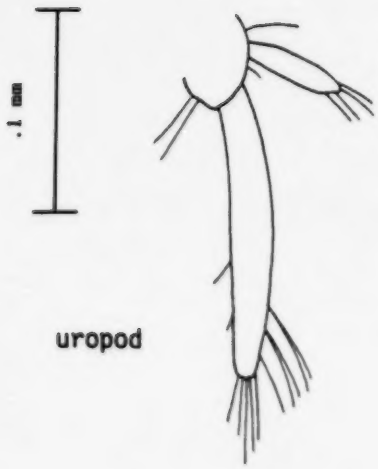
PLATE XXV



operculum



telson

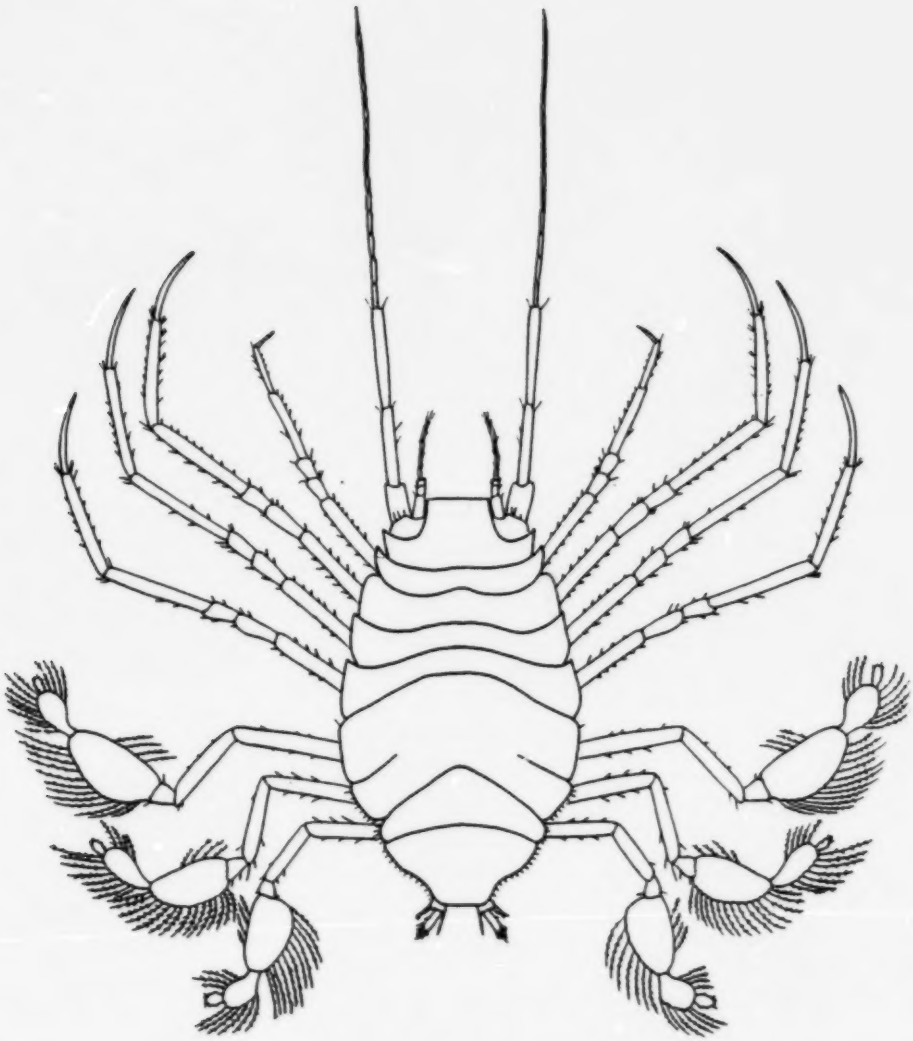


uropod

Desmosoma tenuimanum (G.O. Sars 1865)

EURYCOPIDAE

PLATE XXVI

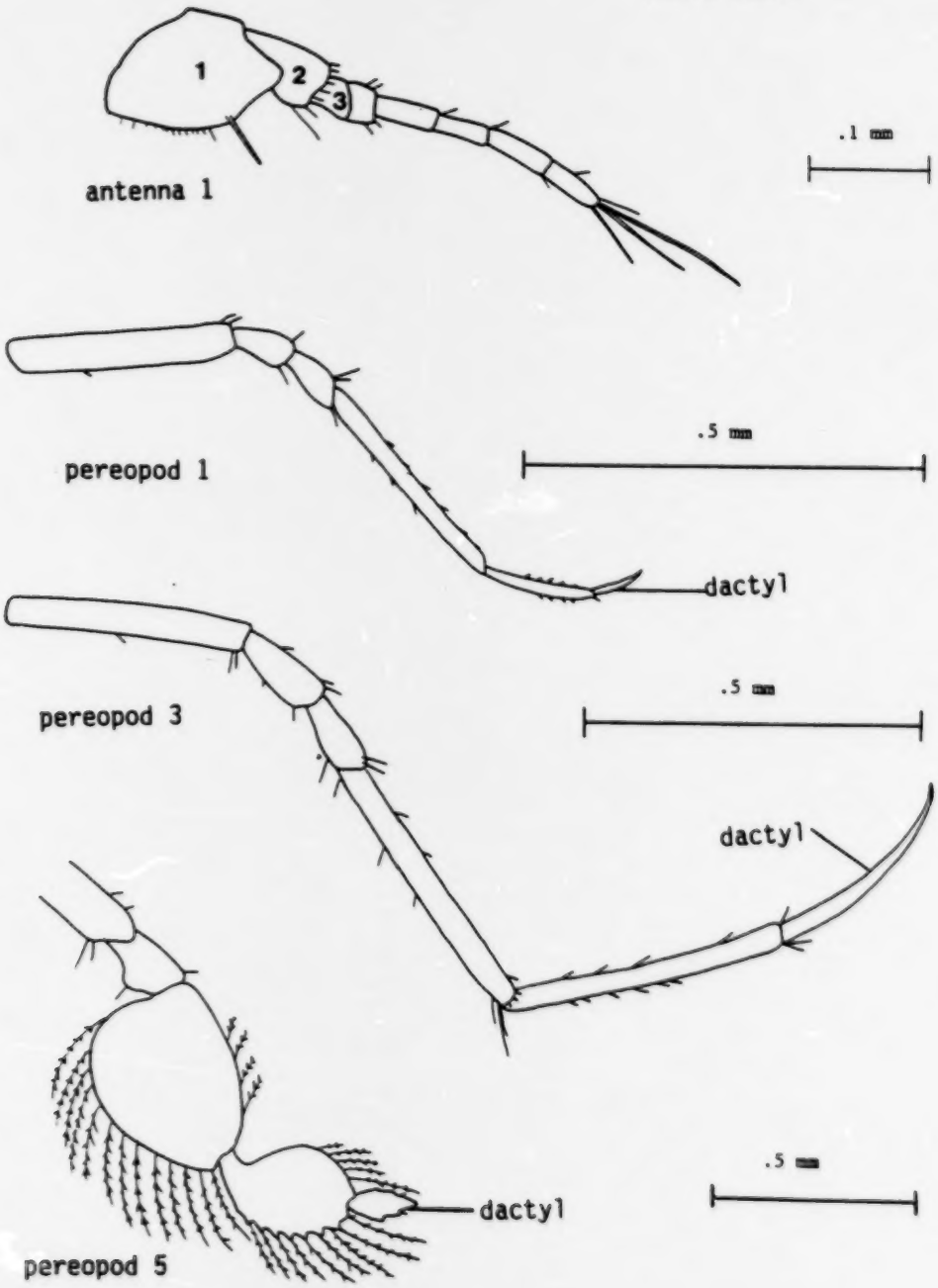


Eurycope pygmaea G.O. Sars 1869

TL = 1.35 mm ♀

EURYCOPIDAE

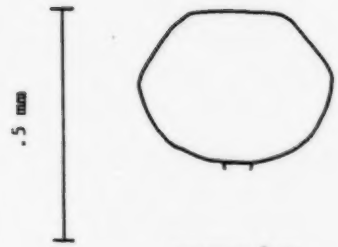
PLATE XXVII



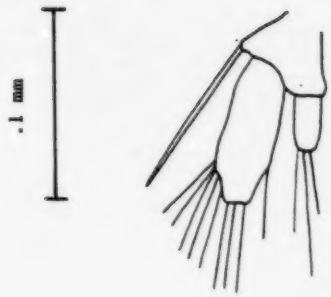
Eurycope pygmaea G.O. Sars 1869

EURYCOPIDAE

PLATE XXVIII



operculum

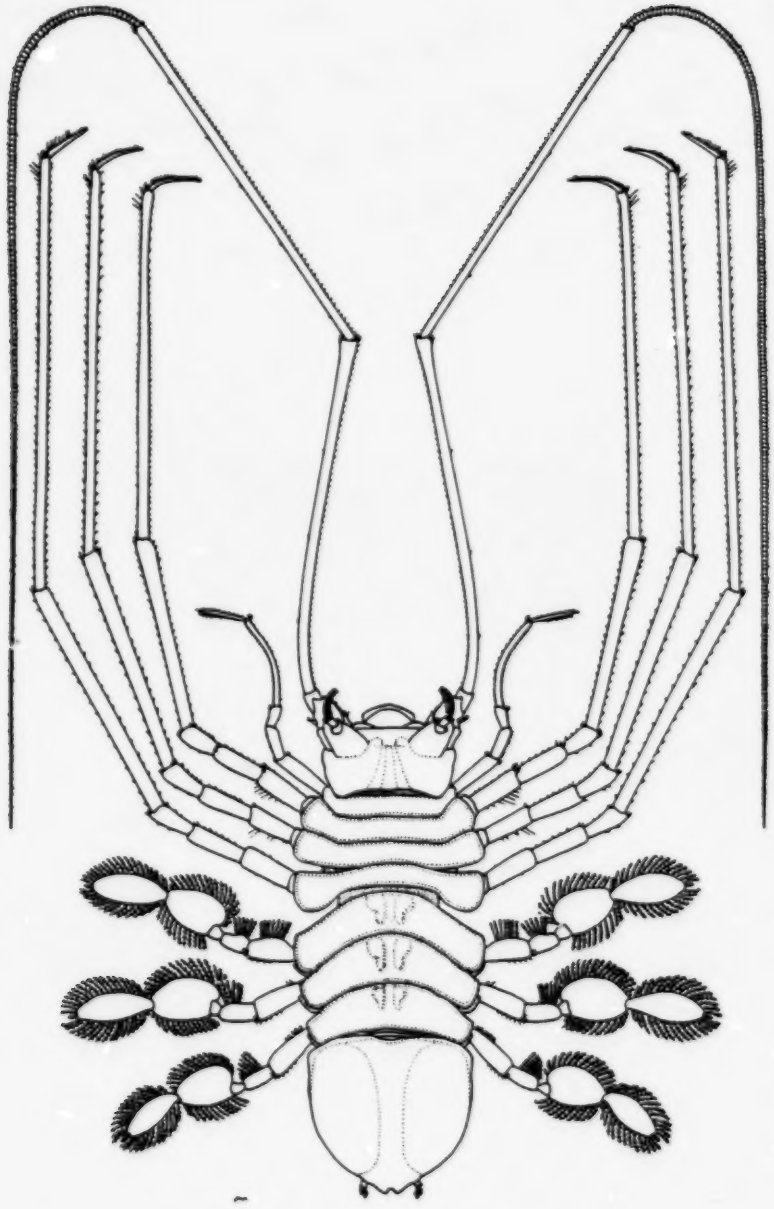


uropod

Eurycope pygmaea G.O. Sars 1869

EURYCOPIDAE

PLATE XXIX

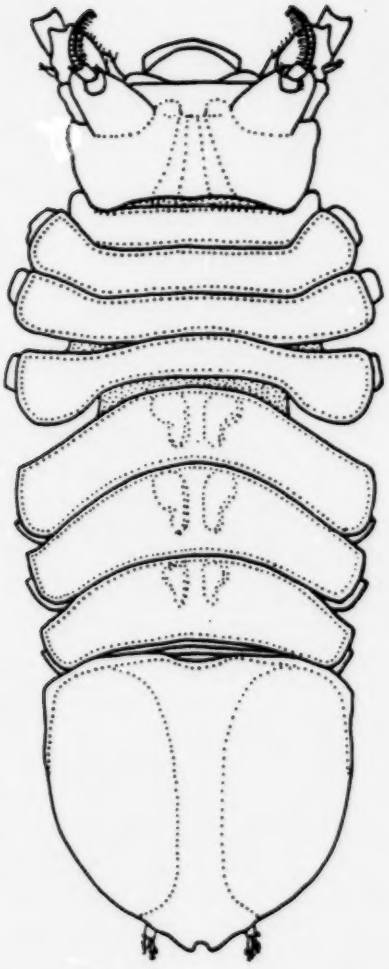


Munnopsurus giganteus (G.O. Sars 1877)

TL = 28 mm ♀

EURYCOPIDAE

PLATE XXX

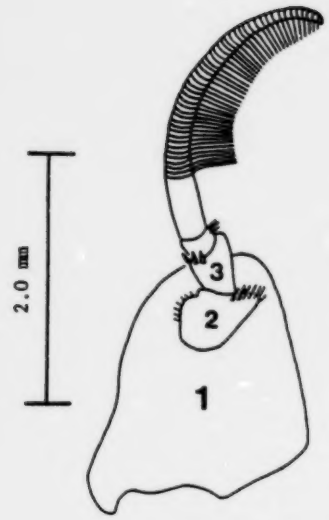


Munnopsurus giganteus (G.O. Sars 1877)

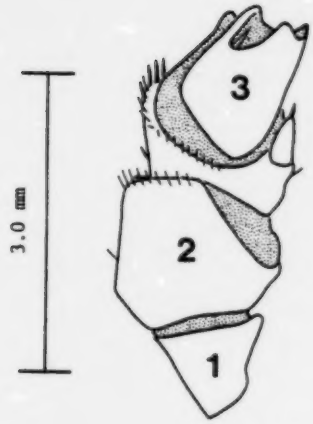
TL = 28 mm ♀

EURYCOPIDAE

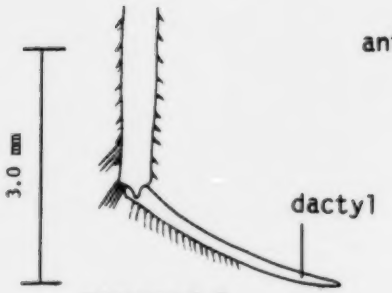
PLATE XXXI



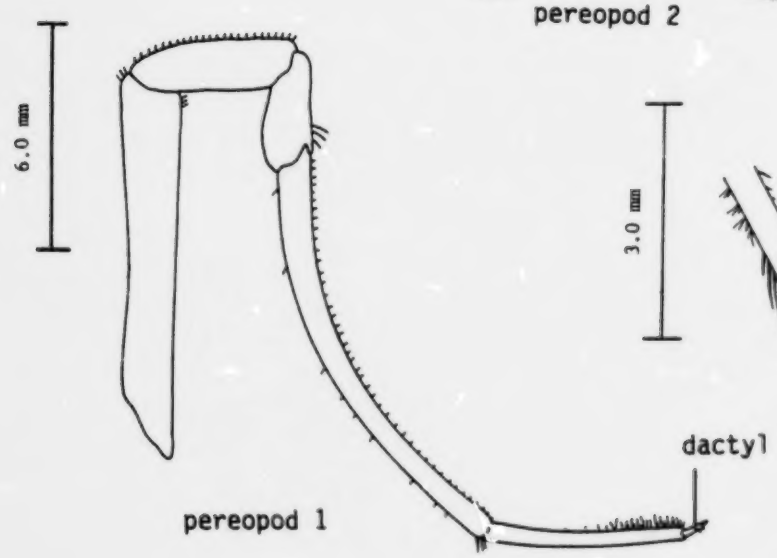
antenna 1



antenna 2 (ventral)



pereopod 2



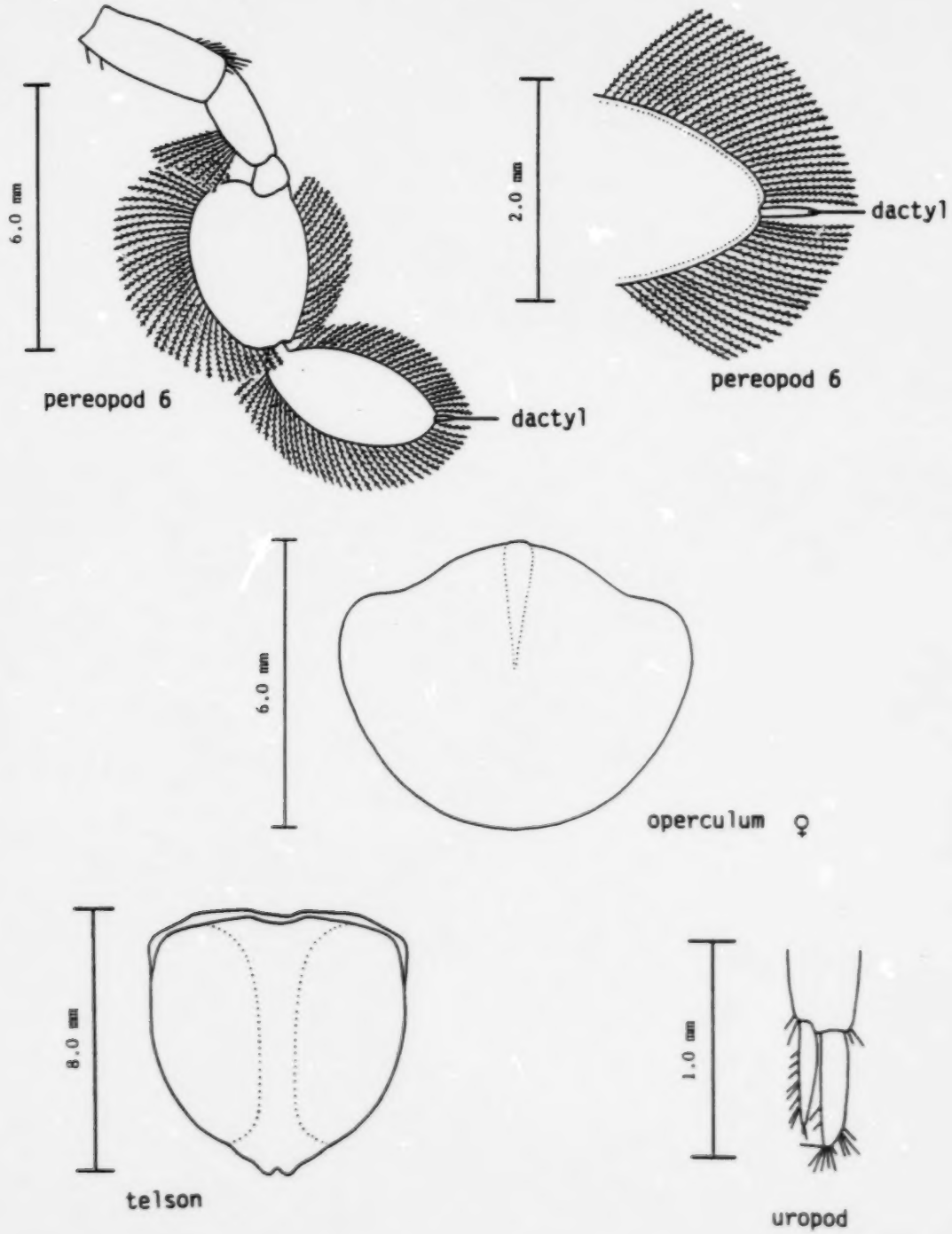
pereopod 1

pereopod 4

Munnopsurus giganteus (G.O. Sars 1877)

PLATE XXXII

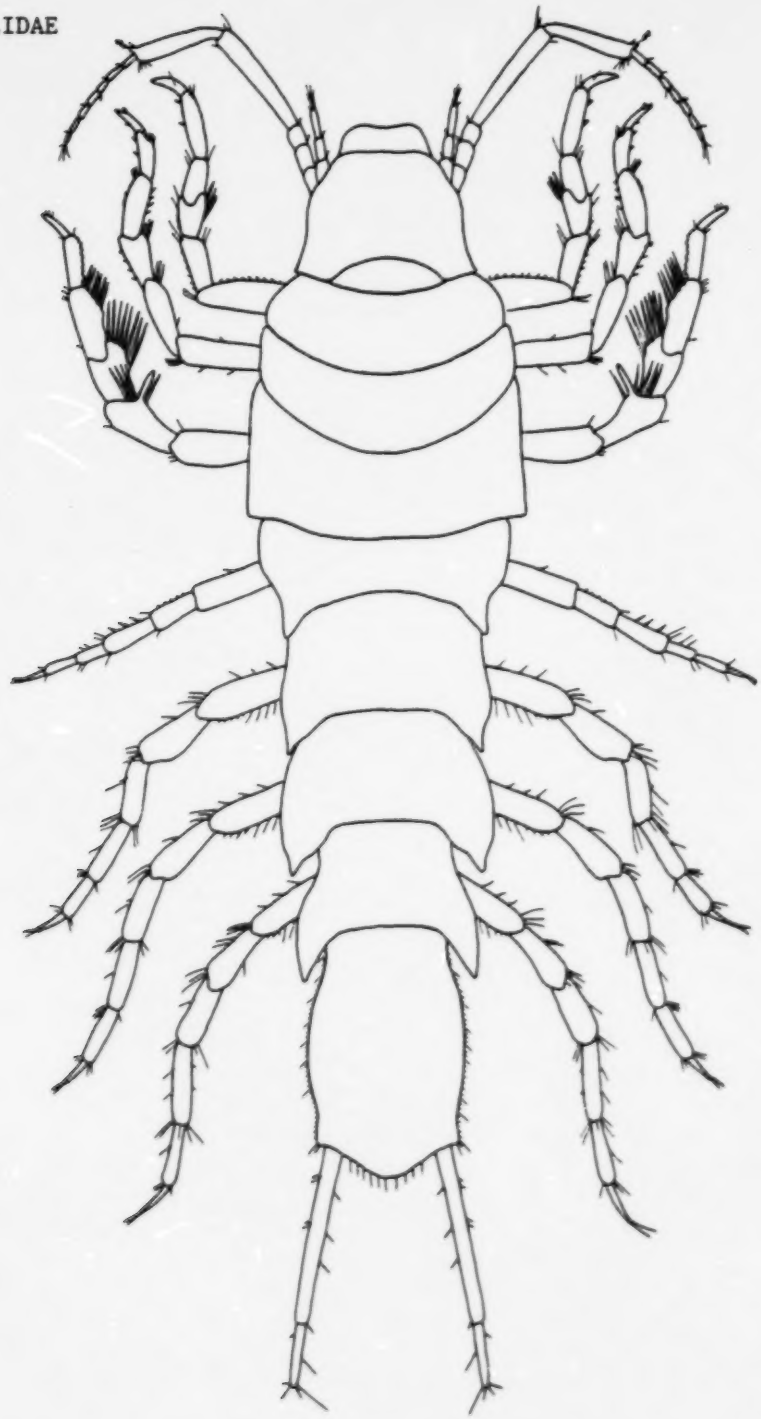
EURYCOPIDAE



Munnopsurus giganteus (G.O. Sars 1877)

PLATE XXXIII

MACROSTYLIDAE

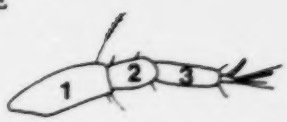


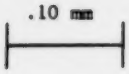
Macrostylis spinifera G.O. Sars 1864

TL = 2.4 mm ♀

PLATE XXXIV

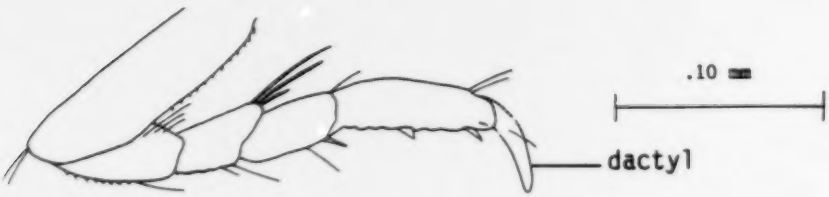
MACROSTYLIDAE





antenna 1

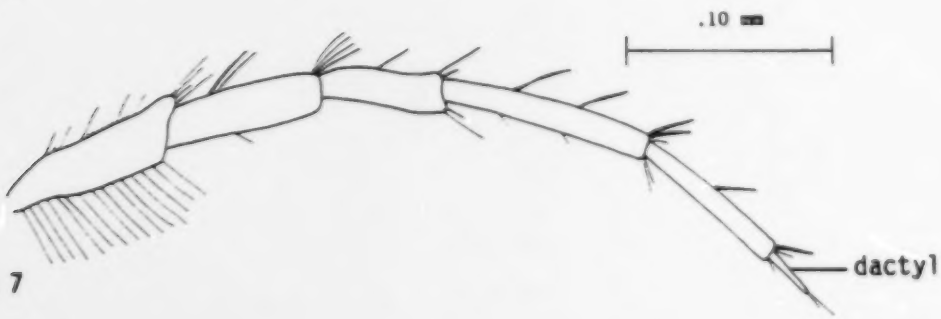
antenna 2



pereopod 1

pereopod 3

pereopod 4

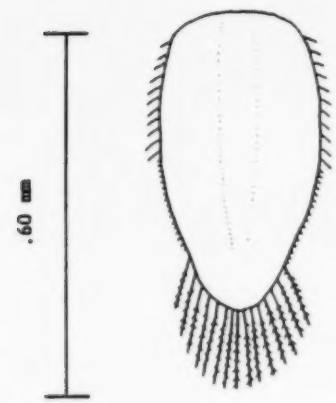


pereopod 7

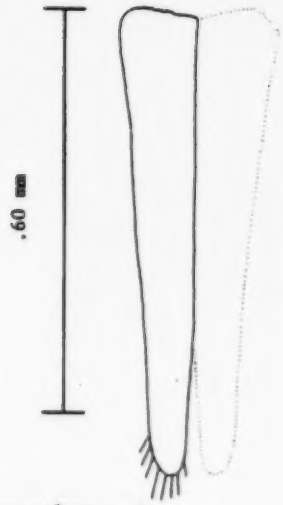
Macrostylis spinifera G.O. Sars 1864

MACROSTYLIDAE

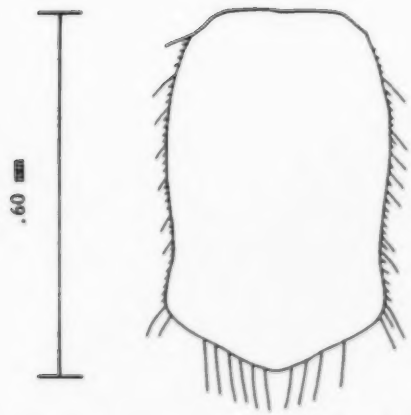
PLATE XXXV



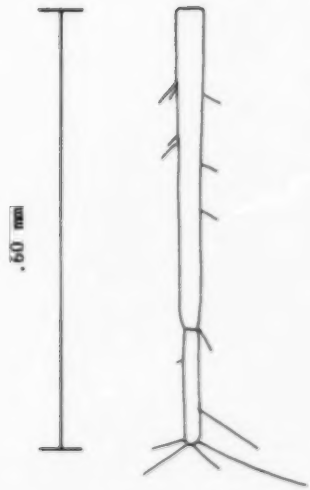
operculum ♀



operculum ♂



telson

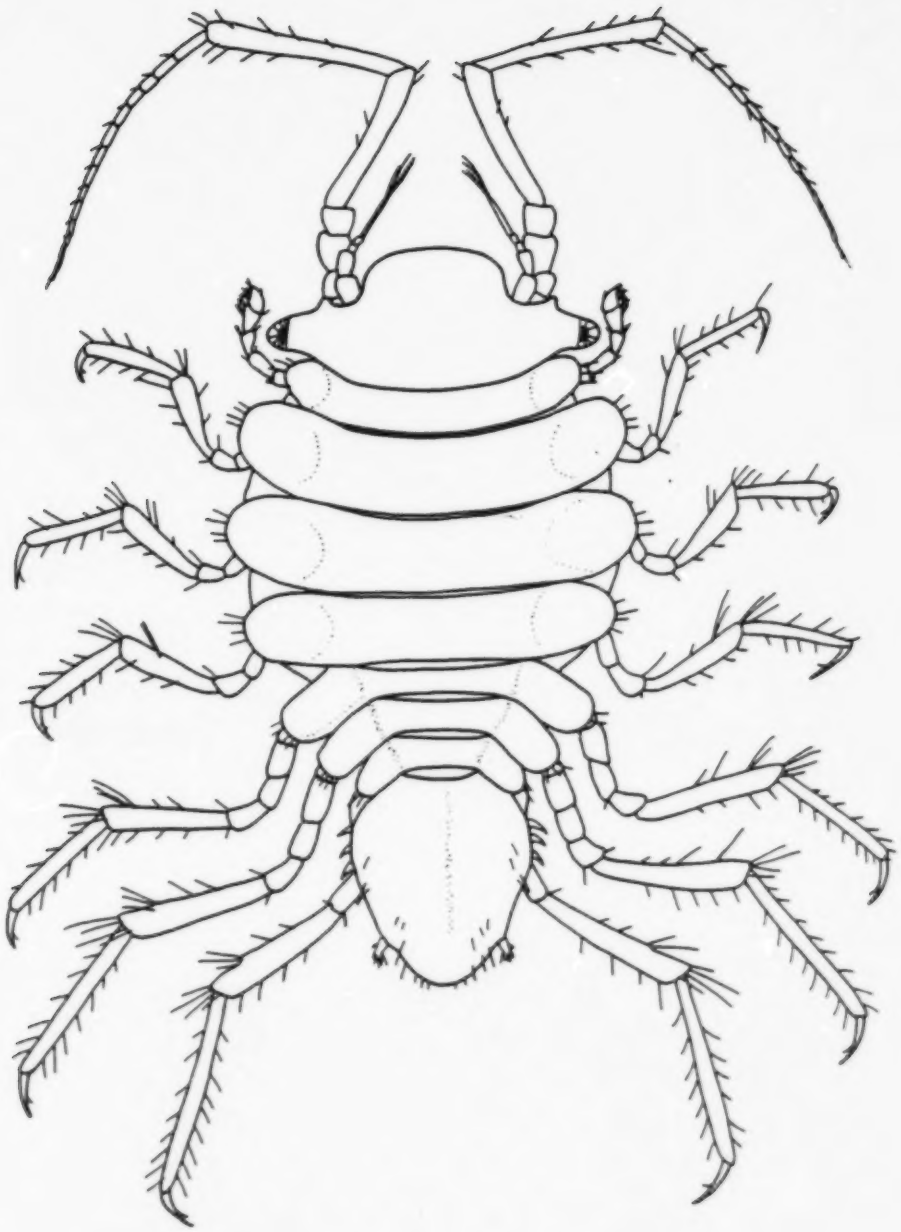


uropod

Macrostylis spinifera G.O. Sars 1864

PLATE XXXVI

MUNNIDAE

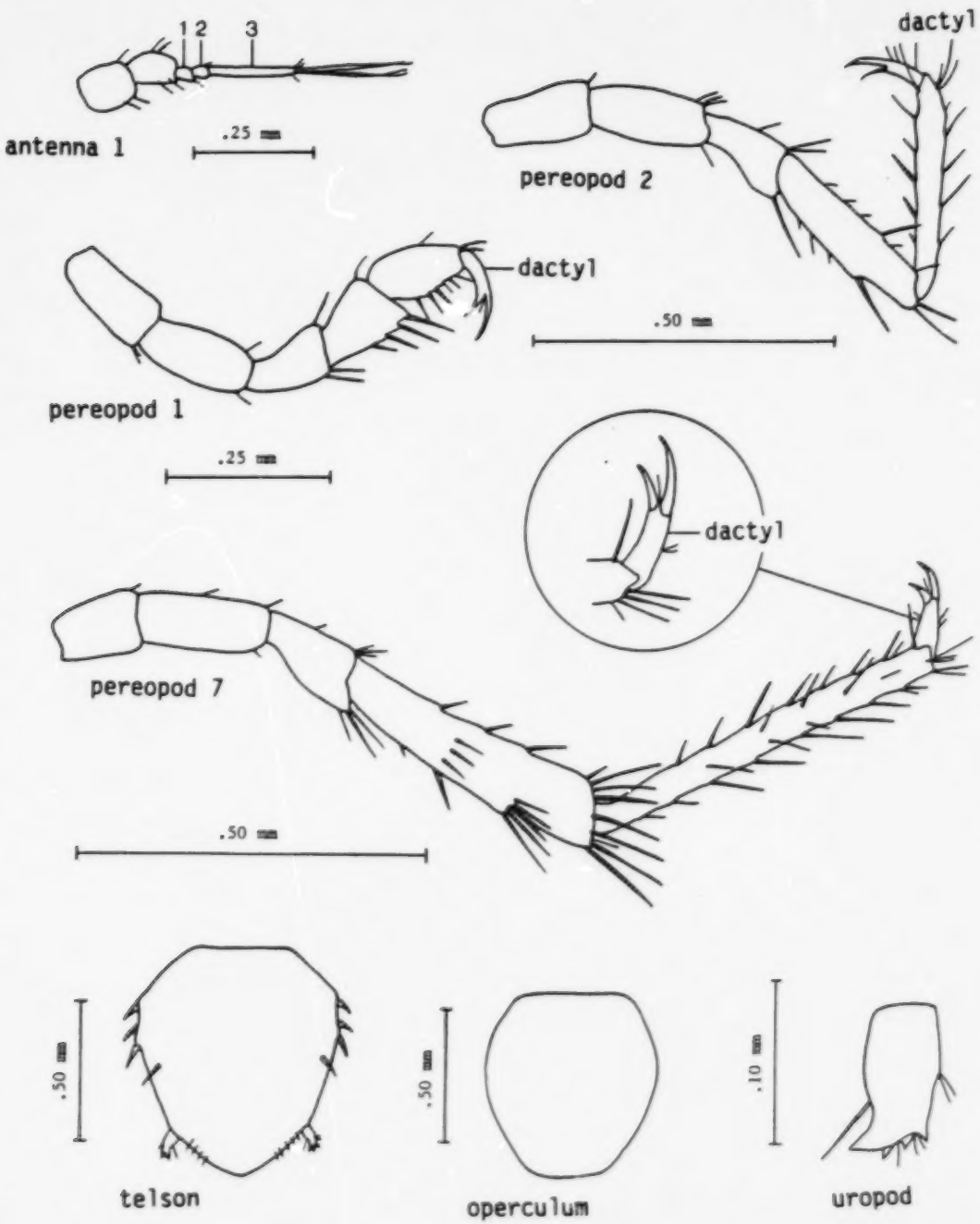


Munna kroeyeri Goodsir 1842
(modified from Sars 1899)

TL = 2.94 mm ♀

MUNNIDAE

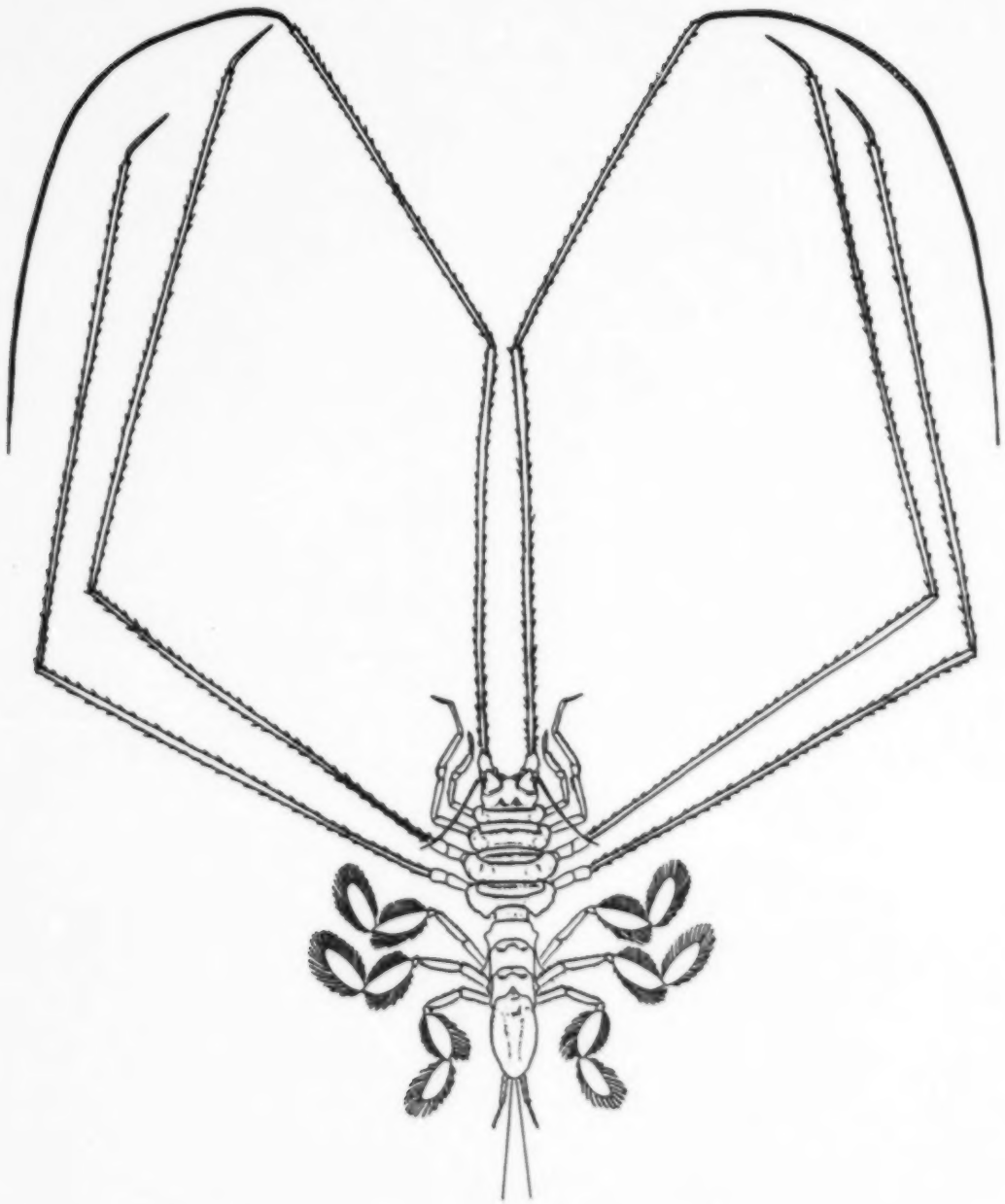
PLATE XXXVII



Munna kroeyeri Goodsir 1842
(modified from Sars 1899)

PLATE XXXVIII

MUNNOPSIDAE

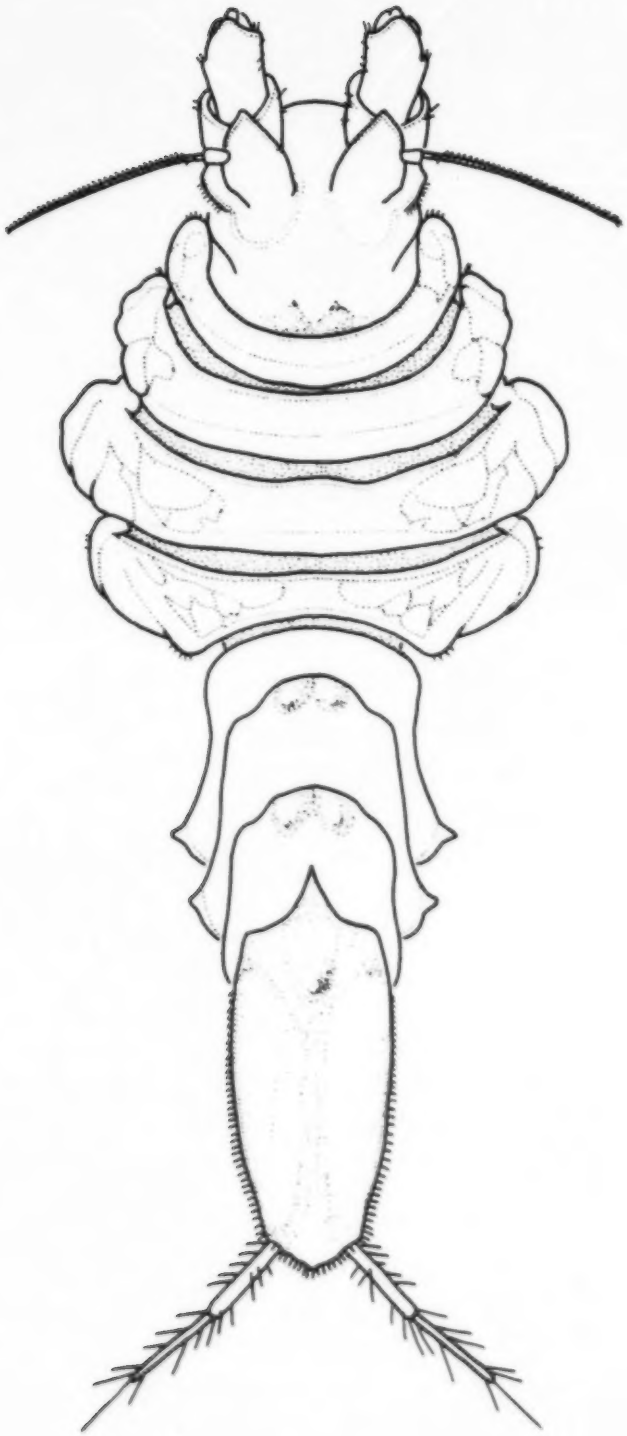


Munnopsis typica M. Sars 1860

TL = 16.0 mm ♂

PLATE XXXIX

MUNNOPSIDAE

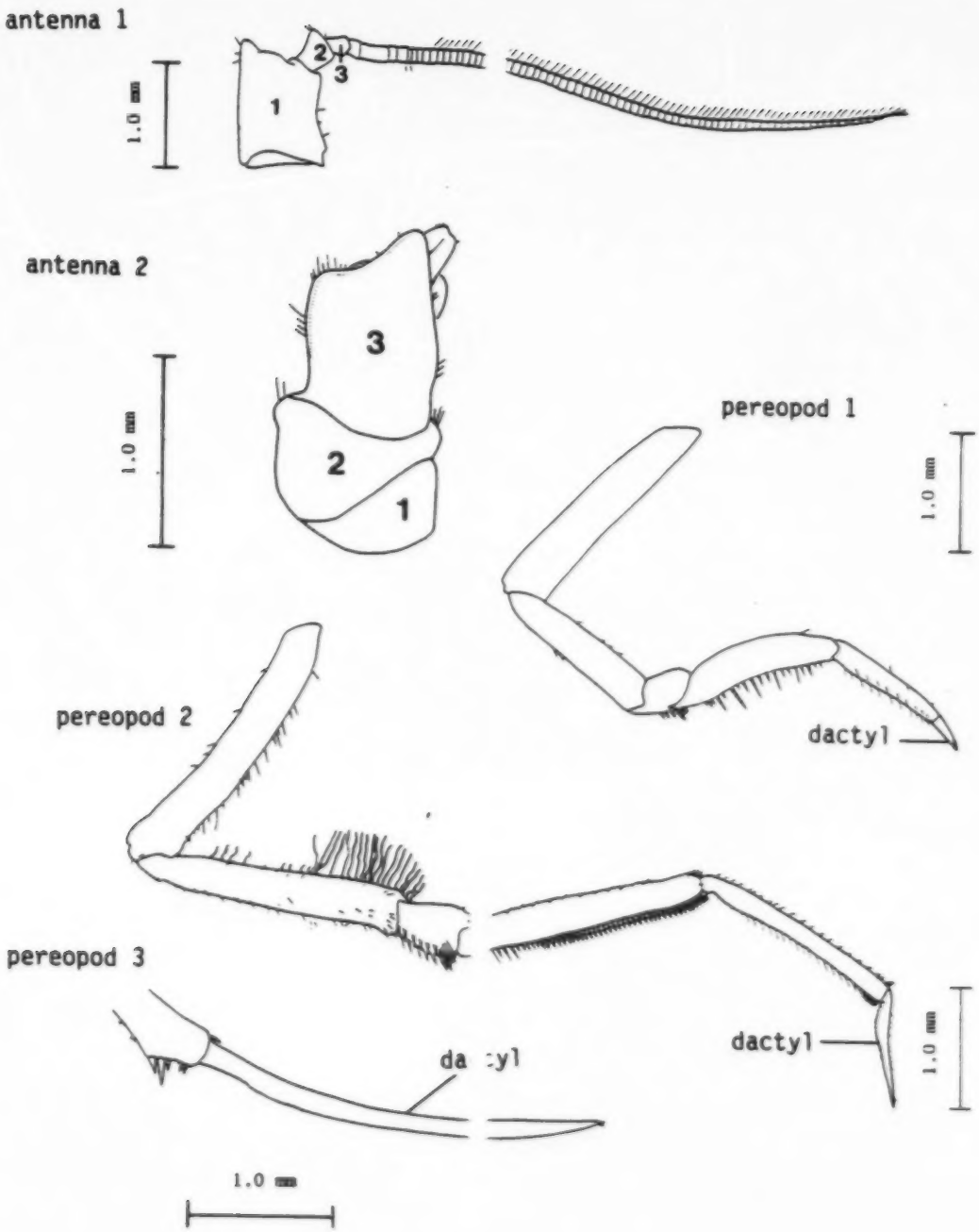


Munnopsis typica M. Sars 1860

TL = 14.0 mm ♀

MUNNOPSIDAE

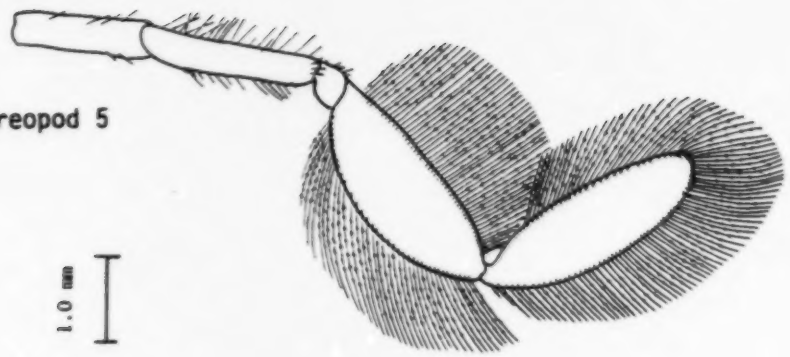
PLATE XL

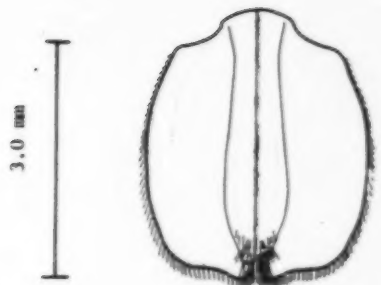


Munnopsis typica M. Sars 1860

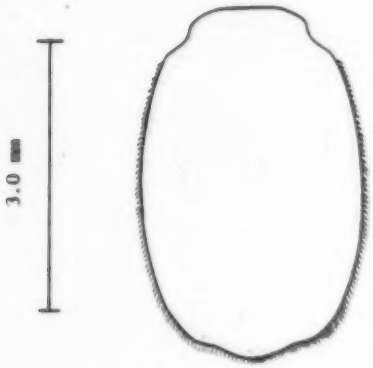
PLATE XLI

MUNNOPSIDAE

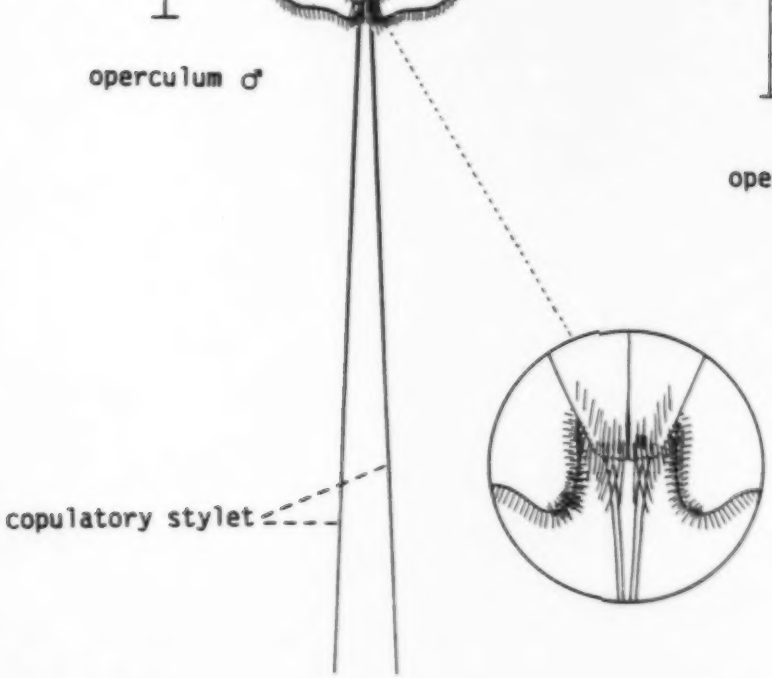


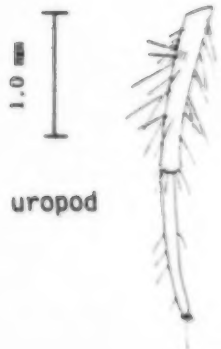


operculum ♂



operculum ♀



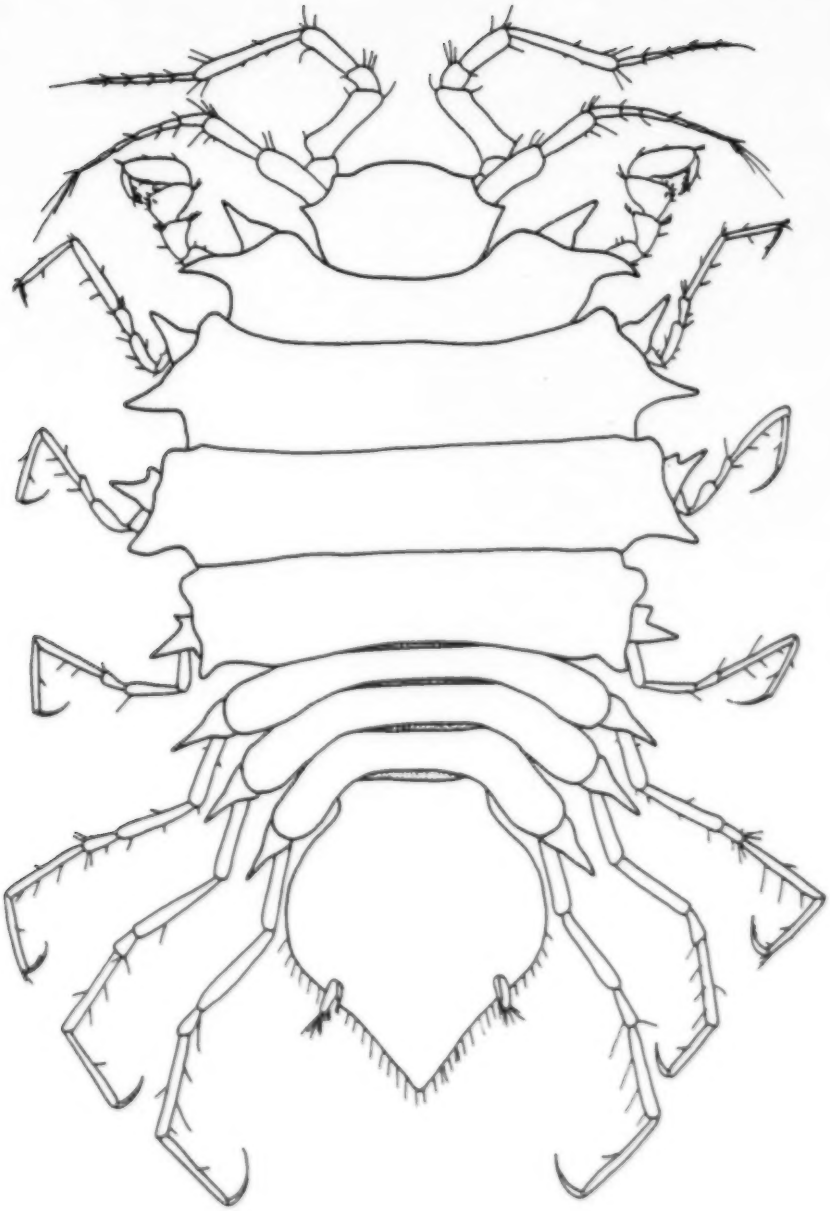


uropod

Munnopsis typica M. Sars 1860

PLEUROGONIIDAE

PLATE XLII

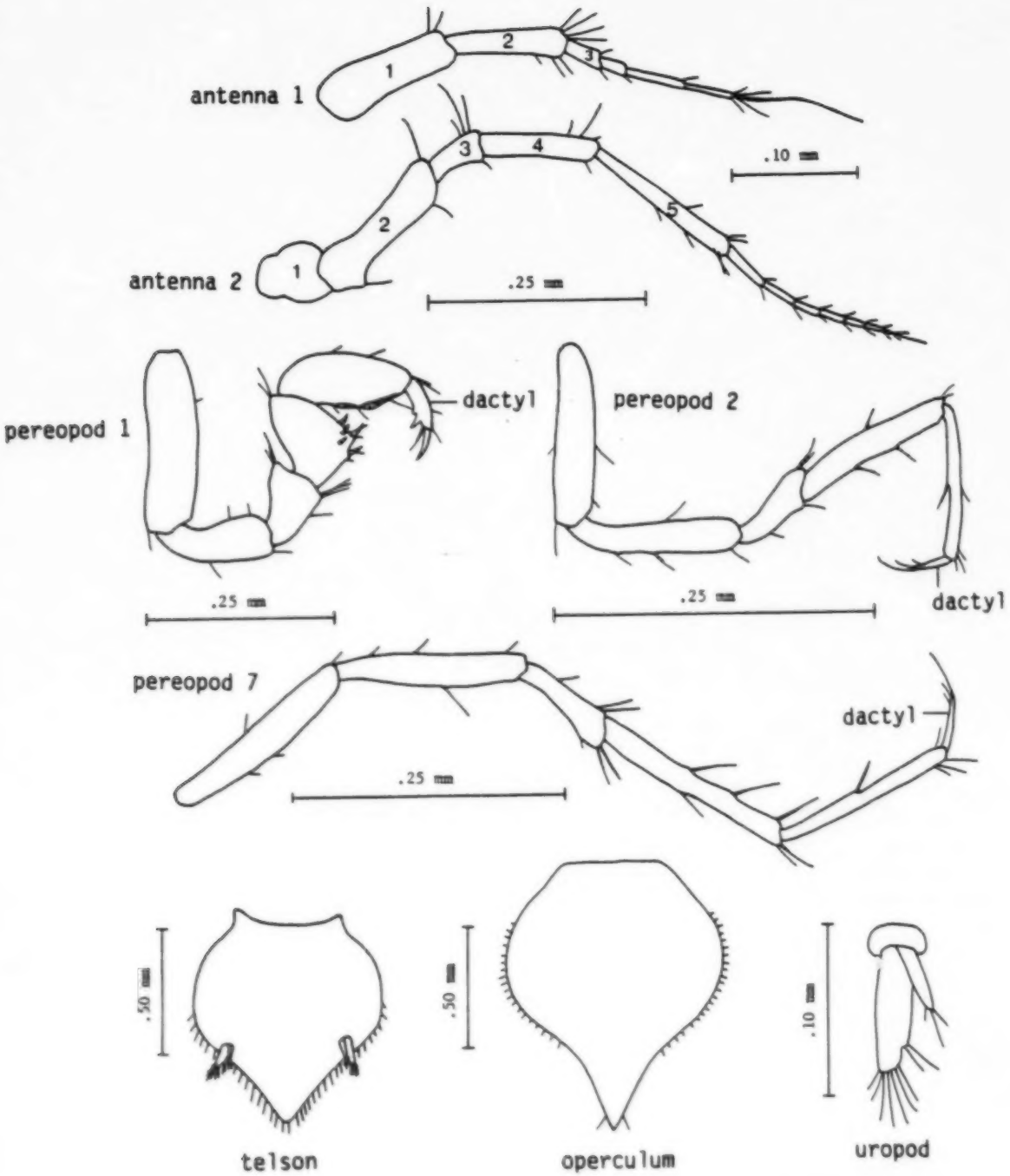


Pleurogonium spinosissimum G.O. Sars 1866
(modified from Sars 1899)

TL = 2.01 mm ♀

PLATE XLIII

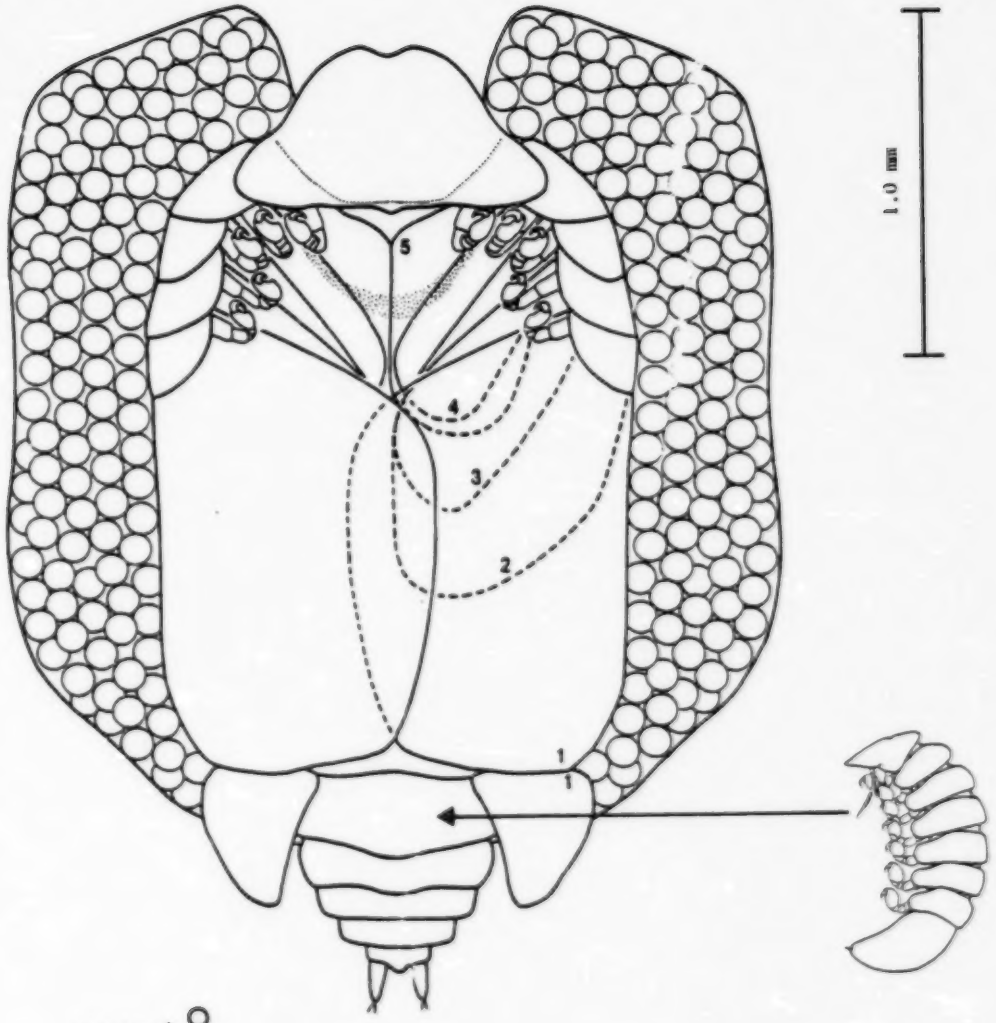
PLEUROGONIIDAE



Pleurogonium spinosissimum G.O. Sars 1866
(modified from Sars 1899)

DAJIDAE

PLATE XLIV



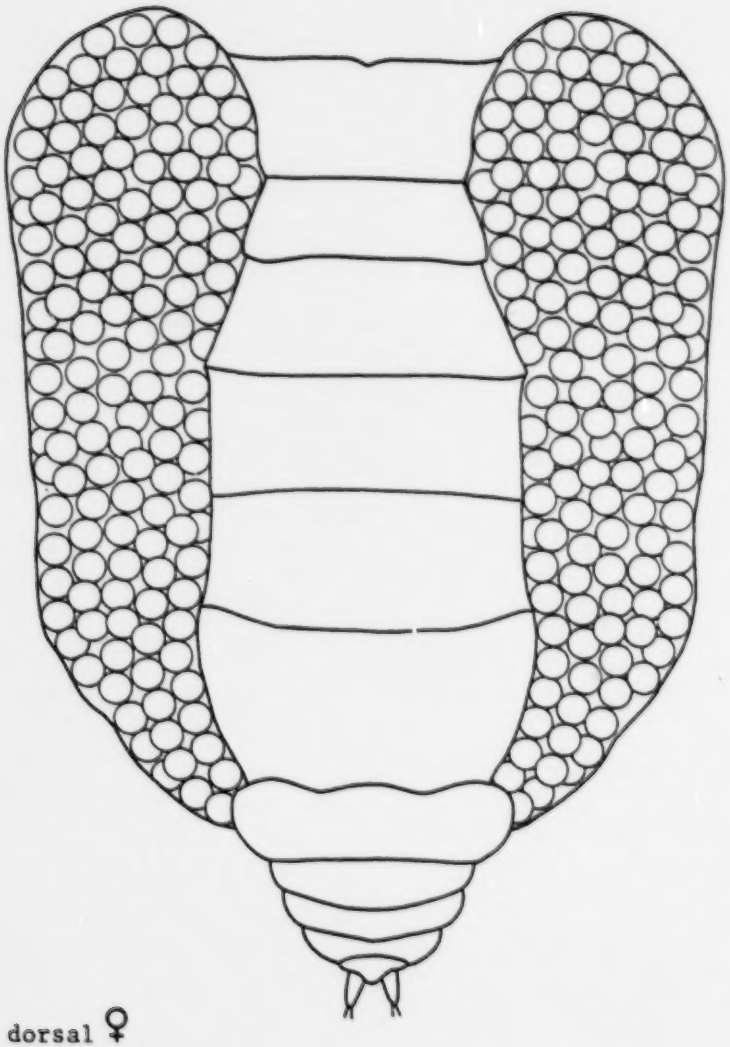
ventral ♀
(original)
TL = 3.0 mm

lateral ♂
(after Sars 1899)

Dajus mysidis Krøyer 1849

DAJIDAE

PLATE XLV



dorsal ♀
(original)
TL = 3.0 mm

dorsal ♂
(after Sars 1899)

Dajus mysidis Krøyer 1849

APPENDIX 1: Extraneous material utilized

Several isopods were illustrated from specimens collected at the following locations:
Desmosoma lineare, Frobisher Bay STA. 76-6 - 16 Aug. 1976
Desmosoma tenuimanum, Brevoort Island STA. 79-6 - 12 Aug. 1979
Eurycope pygmaea, Frobisher Bay STA., 68-5a - 20 Aug. 1968
Gnathia elongata, Frobisher Bay STA. 67-4 - 29 July 1967

The original specimens from the Beaufort Sea for which the species list appearing in the Technical Report entitled; 'Biological Productivity of the Southern Beaufort Sea: zoobenthic studies'. Beaufort Sea Project. Tech. Rep. No. 12 (Wacasey 1975) were not available (J.W. Wacasey, DFO, Ste Anne de Bellevue, Quebec, personal communications). Specimens representing those species were substituted from eastern arctic surveys (courtesy of J. Wacasey).

APPENDIX 2: A parasitic isopod

The inclusion of the isopod Dajus mysidis Krøyer 1849 has been restricted to the addendum, owing to its rare occurrence (2 females obtained) and parasitic mode of life.

SUBORDER: EPICARIDEA

Diagnosis: epicarideans are ectoparasitic on crustaceans: exhibit varying degrees of regressive metamorphosis; sexual dimorphism pronounced; male morphologically dissimilar from female; male elongate, symmetrical, segmented, diminutive in size, often clinging to body of female; female often asymmetrical even when body segmentation apparent, pereopods reduced or absent, cephalon sunken into pereon; 2 rudimentary antennae; 5 pairs of oostegites of variable size; eyes when present dorsal; appendages when present, similar, prehensile; uropods when present, small, simple.

References: Richardson 1899, 1905; Sars 1899; Yashnov 1948; Schultz 1969; Miller 1975.

FAMILY: DAJIDAE

Diagnosis: adult female shield-like, symmetrical, if segmentated visible dorsad; marsupium consists of two separate cavities; oostegites small, may be reduced in number; 4 or 5 pairs of pereopods surround oral area; pleopods rudimentary or absent; uropods simple when present; adult male elongate, symmetrical, head fused with first pereonite; parasitic on euphausiids and mysids.

References: Sars 1899; Richardson 1900, 1905.

Dajus mysidis Krøyer 1849 Plates XLIV-XLV

Male: body elongate, symmetrical; smaller than female, usually found clinging to genital region of female; antenna 1 rudimentary; antennae 2 with 4 flagellar articles; 1st pereonite and head fused; remaining 6 pereonites sharply defined; 7 pairs of pereopods simple, reduced; pleon fused forming an oval plate with 2 rudimentary uropods distally; pleopods absent; male less than 1 mm.

Female: body oval, quadrangular, broader anteriorly; larger than male; head sunken into pereon, frontal margin straight dorsad, with medial cleft; antenna 1 triarticulate; antenna 2 with 8-9 flagellar articles; pereon inflated laterally with 2 large separate cavities, ventral functioning as marsupium; segmentation apparent on dorsal surface; 1st pair of oostegites largest divided by a transverse fold into 2 segments, remaining 4 reduced overlapping in oral region; 5 pairs of pereopods similar, reduced, surrounding oral region; pleon short, 1st pleonite largest, remaining decreasing in size posteriorly; uropods simple, reduced; female up to 4 mm total body length; parasitic on Mysis mixta Lilljeborg and Mysis oculata (Fabricius).

Note: The immature female immediately after metamorphosis superficially resembles the male, but deviates in having 5 pairs of pereopods and the pleon distinctly segmented.

Distribution: Beaufort Sea; Baffin Bay; Davis Strait; Ungava Bay; Labrador to Cape Cod; east and west Greenland; Murchison Sound; west coast Norway; Kara Sea; Barents Sea; Laptev Sea; Spitsberg; Jan Mayen; west Siberia; Franz Josef Land; Norwegian Sea; Sabine Island; Murman coast.

References: Sars 1899, 1900; Richardson 1901, 1904; Hansen 1916; Boone 1920; Gurjanova 1933, 1934; Yashnov 1948.